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THE LITHOBIID GENERA NAMPABIUS, GARIBIUS, TIDA-  
BIUS, AND SIGIBIUS.

*25 species* { *Lithobiidae*

BY RALPH V. CHAMBERLIN.

WITH FIVE PLATES.

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No. 2.— *The Lithobiid Genera Nampabius, Garibius, Tidabius, and Sigibius.*

BY RALPH V. CHAMBERLIN.

THE four new genera dealt with in the present paper include the smallest of the known North American species of Lithobiidae. None of them exceeds ten mm. in length, most of them averaging materially less than this. They occur principally among the layers of damp fallen leaves, under the bark of logs, and in the looser loam of open woods. All seem to have the death-feigning instinct more or less pronounced, when suddenly jarred or otherwise frightened often flexing the body laterally into a circle and lying rigid for some time, when they may be handled with forceps or otherwise without their relaxing. Because of their small size and the effectiveness with which they conceal themselves, specimens of these species are not often secured by the general collector; but one looking for them especially and understanding their habits may nearly always secure one or more species in appropriate habitats throughout the United States excepting the Southwest where they are replaced by *Oabius* (*pylorus* Chamb., *tiganus* Chamb., etc.), *Hesperobius* (*medius* Chamb., *obesus* Stuxb., and allies), and related genera to be considered in a succeeding Bulletin. They may sometimes be secured in considerable numbers by sifting leaves.

In addition to the similarity in many features of habit, the species of these four genera likewise have much in common in general appearance and structure. The genera are, however, readily separated upon critical examination. The discrimination of the species has presented more difficulty. Heretofore the species have remained practically unknown, not only because of the paucity of material in collections, but especially because the characters studied and given in descriptions are, in the main, not truly specific, being either generic in extent or common to a number of species. More detailed and careful study and comparison of the material in extensive collections made by the author personally in various parts of the country has revealed the considerable number of species here described.

The four genera may readily be separated by means of the following key.

*Key to the Genera.*

- a. Articles of antennae from 25 to 35, the number being mostly near 32. Posterior legs of ♂ without special processes or lobes. (Posterior coxae wholly unarmed).
- b. Dorsal spines of anal and penult legs 0, 0, 1, 0, 0, ventral 0, 1, 1, 1, 0. *Sigibius*, gen. nov.
- bb. Dorsal spines of anal legs 0, 0, 2, 0, 0, ventral 0, 1, 3, 1, 0, or 0, 1, 3, 2, 0; dorsal spines of penult legs 0, 0, 3, 1, 0, or 0, 0, 3, 1, 1, ventral 0, 1, 3, 3, 1 or 0, 1, 2, 3, 1. *Tidabius*, gen. nov.
- aa. Articles of antennae normally 20. Either anal or penult legs of ♂ with a special lobe. (Coxae armed or unarmed).
- b. Posterior coxae wholly unarmed; median incision of prosternum semicircular; penult legs of ♂ always bearing at distal end of tibia on dorsal side a small but conspicuous lobe, the anal legs without lobes or crests; posterior angles of 11th and 13th or at least of 13th more or less produced. *Nampabius*, gen. nov.
- bb. Last 3 or 4 pairs of coxae dorsally armed; median incision of prosternum V-shaped; penult legs of ♂ without any such lobe, but anal legs bearing at distal end of tibia a small crest; posterior angles of none of the dorsal plates at all produced. *Garibius*, gen. nov.

## NAMPABIUS, gen. nov.

Body conspicuously attenuated cephalad, with the first dorsal plate much narrower than the head and also narrower than the third plate. Mostly robust, varying from 6 to 8.5 times as long as the width of the 10th plate.

Antennae short; composed of 20 articles.

Ocelli in 2, or, less commonly, in 3, longitudinal series; the single ocellus mostly a little smaller than the most caudal one of the dorsal series.

Prosternal teeth 2+2. Median incision semicircular in outline, never acute at bottom. (Plate 1, fig. 2).

Eleventh and thirteenth dorsal plates with the caudal angles more or less produced or sometimes that of thirteenth alone distinctly extended; angles of other plates straight or excised.

Claw of the female gonopods tripartite, with the lobes subequal or



the median longest, all usually more or less rounded distally. Basal spines 2+2, long and usually slender, the sides, as seen in ventral view, converging to near the apex or beginning of the acuminate distal portion which is very short. (Plate 2, fig. 6).

Coxal pores very small; circular, 2, 2, 2, 2 to 2, 3, 3, 3 in number.

Ventral spines of the anal legs 0, 1, 1, 0, 0 or 0, 1, 1, 1, 0; dorsal 0, 0, 0, 0, 0 or 0, 0, 2, 0, 0; claws 2 or, rarely, but 1. Ventral spines of penult legs 0, 1, 1, 1, 0 or 0, 1, 2, 1, 0; dorsal spines 0, 0, 0, 0, 0 or 0, 0, 2, 0, 0; claws 2 or, rarely, but 1. Ventral spines of thirteenth legs 0, 0, 2, 1, 1 to 0, 0, 0, 1, 1; dorsal from 0, 0, 0, 0, 0 to 0, 0, 2, 1, 1. Ventral spines of twelfth legs from 0, 0, 0, 0, 1 to 0, 0, 0, 2, 1; dorsal from 0, 0, 0, 0, 0 to 0, 0, 2, 1, 2. Ventral spines of eleventh legs 0, 0, 0, 0, 1 to 0, 0, 0, 2, 1; dorsal from 0, 0, 0, 0, 1 to 0, 0, 0, 2, 2. First two to first four pairs of legs with no ventral spines on any joint; and the third joint of the first twelve or thirteen pairs of legs ventrally unarmed. The posterior coxae are wholly unarmed.

Anal legs in the male short; moderately and uniformly inflated; without special lobes or furrows. Penult legs with the fifth article produced at its distal end on the dorsal or dorsomesal side into a small subcylindric or distally expanded lobe bearing a number of sensory hairs.

TYPE.—*N. virginensis*, sp. nov.

DISTRIBUTION.—Eastern and Southeastern States, in the latter section occurring chiefly in or near the mountainous parts.

The species of this genus are the smallest members of the family, all known forms being under 7.5 mm. in length. In proportions they are mostly relatively robust and conspicuously narrowed cephalad. They vary considerably in color, some being testaceous, some ferruginous, and others chestnut. While the head may be paler than the dorsum, it is usually darker, frequently being a shining reddish black. As in *Tidabius*, the posterior legs, especially distally, are nearly always more brightly pigmented, being commonly bright yellow or orange. These forms occur commonly in and beneath layers of fallen leaves and loose piles of sticks.

The following key will aid in the identification of the known species.

*Key to species of Nampabius.*

- a. Neither the anal nor the penult legs with any dorsal spines.  
Ventral spines of anal legs 0, 1, 1, 0, 0.  
*N. fungiferopes* (Chamberlin).
- aa. Anal and penult legs with the third joint armed with 2 dorsal spines.

- b. Dorsal spines of twelfth legs 0, 0, 2, 1, 2; (ventral spines of ninth to twelfth legs 0, 0, 0, 2, 1). *N. virginiensis*, sp. nov.
- bb. Dorsal spines of twelfth legs not 0, 0, 2, 1, 2.
- c. Third joint of twelfth legs unarmed dorsally (spines 0, 0, 0, 1, 2 or fewer).
- d. Dorsal spines of twelfth legs 0, 0, 0, 0 (1), 1; of the eleventh 0, 0, 0, 1, 1. *N. parienus*, sp. nov.
- dd. Dorsal spines of twelfth legs 0, 0, 0, 1, 2; of the eleventh 0, 0, 0, 1, 2 or 0, 0, 0, 2, 2.
- e. Dorsal spines of tenth and eleventh legs 0, 0, 0, 1, 2; ventral spines of thirteenth legs 0, 0, 1, 1, 1. *N. embius*, sp. nov.
- ee. Dorsal spines of eleventh legs 0, 0, 0, 2, 2; ventral spines of thirteenth legs 0, 0, 2, 1, 1.
- f. Ventral spines of twelfth legs 0, 0, 1, 2, 1; of eighth to eleventh 0, 0, 0, 2, 1; ocelli cir. 6 in two series. *N. inimicus*, sp. nov.
- ff. Ventral spines of twelfth legs 0, 0, 0, 1, 1; of eighth to eleventh also 0, 0, 0, 1, 1; ocelli 10 or more in three series. *N. georgianus*, sp. nov.
- ee. Third joint of twelfth legs armed with one or two dorsal spines.
- d. Dorsal spines of twelfth legs 0, 0, 1, 1, 2 or 0, 0, 2, 1, 1; of tenth and eleventh 0, 0, 0, 2, 2. *N. carolinensis*, sp. nov.
- dd. Dorsal spines of twelfth legs 0, 0, 2, 1, 0 or 0, 0, 2, 1, 1; of tenth and eleventh 0, 0, 0, 0, 1 or 0, 0, 0, 1, 1.
- e. Dorsal spines of twelfth and thirteenth legs 0, 0, 2, 1, 0; of eleventh 0, 0, 0, 1, 1. *N. tennesseensis*, sp. nov.
- ee. Dorsal spines of twelfth and thirteenth legs 0, 0, 2, 1, 1; of eleventh 0, 0, 0, 1.
- f. Near 8.5 times longer than width of tenth plate. *N. longiceps*, sp. nov.
- ff. Not more than 7 times longer than width of tenth plate. *N. lulac*, sp. nov.

NOTE.—The key does not include *N. lundii* (Meinert) the insufficient description of which must leave its identity in doubt until the types can be restudied. See further under the account of this species.

## NAMPABIUS FUNGIFEROPES (Chamberlin).

*Lithobius fungiferopes* Chamberlin, Proc. Acad. nat. sci. Phil.,  
1904, 56, p. 652.

DIAGNOSIS.—Dorsum testaceous to dark, more or less reddish brown, in life more or less suffused with purplish. Head darker, almost black, in front of suture paler and with a tendency toward ferruginous.

Body about  $6\frac{3}{4}$  times longer than width of tenth plate.

Head considerably wider than long.

Ocelli mostly 4 to 6 in two series.

Prosternum about 1.54–1.6 times wider than long; distance between chitinous spots about 2.3–2.4 times greater than width at median incision and 3.8 or 3.9 times the dental line.

First dorsal plate about 1.9 times wider than long.

Coxal pores 2, 2, 2, 2.

Claw of female gonopods short and wide with the median lobe considerably largest, the lateral equal. Spines of moderate width, the sides converging distad to the short, abruptly subacute apex.

Twelfth to anal legs inclusive with no dorsal spines. Ventral spines of anal 0, 1, 1, 0, 0; of penult, 0, 1, 1, 1, 0. Ventral spines of ninth to thirteenth legs (also of fifth to ninth) inclusive 0, 0, 0, 0, 1. Dorsal spines of tenth and eleventh legs (also of second to tenth) 0, 0, 0, 0, 1.

Process of the penult legs in the male conspicuously expanding distad; bearing the usual hairs. Tarsal joints abruptly and considerably more slender than the tibia. (Plate 1, fig. 6–7).

DESCRIPTION.—Above testaceous to dark, more or less reddish, brown, in life especially commonly conspicuously suffused with violaceous or purplish. Head deeper in color, almost black, but paler in front of suture where it may show a tendency toward ferruginous. Antennae rufous distally, proximally brown or purplish brown. Prosternum dark brown with the prehensorial feet lighter. Venter light brown or testaceous, in life suffused with purplish. Legs pale brown, in life of a distinctly purplish or violaceous tinge proximally, being yellow distally; posterior pairs more strongly pigmented as usual, bright yellow except proximally.

Body strongly attenuated cephalad of tenth plate as usual. Proportionately robust, being mostly  $6.75+$  times longer than width of tenth plate. The widths of head and first, third, eighth, tenth, and twelfth plates to each other as 37:31:33:42:42:39.

Head wider than long (mostly from 37:34 to 37:36); widely rounded anteriorly. Hairs long and sparse.

Antennae short; composed of the normal twenty articles, all of which are short. Hairs of moderate length, not very dense, more sparse proximally.

Eyes composed mostly of from 4 to 6 ocelli which are arranged in two series:—thus, 1+2, 1 to 1+3, 2. The single ocellus smaller than most of the others. All ocelli well pigmented.

Prosternum 1.54–1.6 times wider than long. Distance between chitinous spots near 2.38 times the width at level of bottom of mesal incision; about 3.87 times the dental line, the anterior portion being more strongly narrowed than in the related species. Median incision shallow, not large, of the usual semicircular form. Teeth small and acute, equal or nearly so, the interval between each pair narrow and well rounded at bottom. Sides slanting directly from close to base of each ectal tooth, nearly straight, being slightly concave near middle of length.

First dorsal plate widest at anterior end, the sides at first but little and then more strongly converging caudad and rounding in about the caudal corners; nearly 1.9 times wider than long. Posterior corners of the eleventh and more distinctly of the thirteenth plates weakly produced, those of the ninth straight.

Coxal pores small and circular; mostly 2, 2, 2, 2.

Spines of first legs  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 0, 0}$ ; of second to fourth inclusive  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of fifth to eleventh inclusive  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 1}$ ; of twelfth and thirteenth,  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 0, 1}$ ; of the penult  $\frac{0, 0, 0, 0, 0}{0, 1, 1, 1, 0}$ , the claws 2; of the anal  $\frac{0, 0, 0, 0, 0}{0, 1, 1, 0, 0}$ , claws 2, the accessory claw easily lost from preserved specimens in both anal and penult pairs.

In the male the anal and penult legs are short and but moderately inflated; longitudinally sulcate along ectal or anterior side, more distinctly so on fourth and fifth articles. In the penult legs the tarsal joints are abruptly and considerably more slender than the tibia; tibia with the distal mesodorsal corner obliquely complanate and there bearing the usual small process, this being in this species conspicuously widened at the distal end (see Plate 1, fig. 6 and 7) and bearing on its distal surface the usual sensory hairs.

Claw of female gonopods short and relatively wide, scarcely curved; tripartite, the middle lobe considerably larger than the two lateral which are about equal, all lobes distally narrowly rounded. Spines

moderately wide, with the sides converging from base distad, toward ends more abruptly bending in to the acute or subacute apex. Mesal side of first article of gonopods nearly straight and parallel with its fellow.

Length from 5 to nearly 7 mm.

TYPE LOCALITY.—New York (Ithaca!).

LOCALITIES.—New York (Ithaca!); Vermont (Jamaica! Grout's Mill!).

*NAMPABIUS VIRGINIENSIS*, sp. nov.

DIAGNOSIS.—Dorsum testaceous to dark reddish or ferruginous brown. Head more or less ferruginous, darker caudad of suture.

Body robust, being mostly but 6.25 or 6.3 times longer than width of the tenth plate.

Head equal in length and breadth; cordate.

Ocelli mostly 6 or 7 in two series.

Prosternum about 1.63 times wider than long, the anterior portion being short. Distance between chitinous spots only 1.7 times greater than width at median incision and but 2.9 times greater than the dental line.

First dorsal plate nearly 1.9 times wider than long.

Coxal pores 2, 2, 2, 2-2, 3, 3, 3.

Claw of female gonopods with the outer latest tooth somewhat smaller than the inner. Spines long, their sides moderately converging to near apex where curving in more abruptly to the acute apex.

Dorsal spines of anal and of penult legs 0, 0, 2, 0, 0; ventral spines of these legs 0, 1, 1, 1, 0. Dorsal spines of thirteenth legs 0, 0, 2, 1, 0; ventral 0, 0, 2, 1, 1. Dorsal spines of twelfth legs 0, 0, 2, 1, 2. Dorsal spines of tenth and eleventh legs 0, 0, 0, 2, 2. Ventral spines of ninth to twelfth legs inclusive 0, 0, 0, 2, 1.

Process of penult legs of male subcylindric; expanded somewhat distally, flat-topped and on the distal surface bearing a subdense patch of moderately long sensory hairs. (Plate 1, fig. 4-5).

DESCRIPTION.—Dorsally testaceous to dark reddish or ferruginous brown, more reddish anteriorly and posteriorly. Head more or less ferruginous, darker, dusky, caudad of the suture. Antennae like the head; pale at tips. Prosternum brown, with the prehensorial feet paler. Venter pale yellowish to light reddish brown, the caudal plates darker. Legs pale yellow to testaceous, with the posterior pairs, excepting at base, bright yellow or somewhat orange.

Body attenuated as usual. Typically near 6.25 or 6.3 times longer than width of the tenth plate. A female 5 mm. long has the widths of head and first, third, eighth, tenth, and twelfth plates to each other as 37:33:35:42:42:42.

Head nearly equal in length and breadth. Cordate; widest a little in front of marginal breaks from where it narrows continuously forwards.

Antennae very short; moderately attenuated. Composed of the usual twenty articles which are short and very short; decreasing distad from the second.

Eyes composed mostly of 6 or 7 ocelli arranged in 2 series:—thus 1+3, 2 or 1+4, 2. Dark. The most caudal ocellus of upper row considerably larger than the single one, the first of lower row less markedly larger.

Prosternum about 1.63 times wider than long. Distance between chitinous spots only 1.7 times greater than width at level of bottom of mesal incision which is nearly in line with caudal ends of lateral slopes; 2.9 times longer than the dental line which is also thus longer than usual. Median incision large and conspicuous, of the usual form. Teeth subequal, small and acute, the interval between each pair semicircular; line of apices recurved. Sides straight or a little incurved, short.

First dorsal plate widest at anterior end from where the sides converge caudad considerably; nearly 1.9 times wider than long. Thirteenth dorsal plate with posterior corners moderately produced, those of the eleventh less so as usual; caudal margin of ninth plate straight.

Coxal pores small; 2, 2, 2, 2 to 2, 3, 3, 3.

Spines of the first legs  $\frac{0, 0, 0, 0, 0-0, 0, 0, 0, 1}{0, 0, 0, 0, 1}$ ; of the second  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of the third to seventh inclusive,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the eighth  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of the ninth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 2, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 2, 1}$ ; of the thirteenth  $\frac{0, 0, 2, 1, 0}{0, 0, 2, 1, 1}$ ; of the penult  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ ; of the anal  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ .

In the male the anal legs are short, moderately and uniformly inflated, and without special modifications. Penult legs similar to anal but the fifth article obliquely complanate at distal end on mesodorsal side and there bearing the usual small lobe which is subcylindric and somewhat expanded distad, especially on side toward distal end of leg; sensory hairs borne on distal surface of lobe rather long and subdense. (Plate 1, fig. 4-5).



Claw of female gonopods of moderate size; considerably curved; tripartite; the inner and median teeth not much different in size, the outer one smaller. Spines rather long, the sides as usual converging from base distad, toward end more strongly curving in to meet at the acute apex. Inner side of first article nearly straight, a little diverging from its fellow proximad. Length near 5 mm.

TYPE LOCALITY.—Virginia (Natural Bridge! August, 1910).

LOCALITIES.—Virginia (Natural Bridge!); Tennessee (Unaka Springs!).

*NAMPABIUS PARIENUS*, sp. nov.

DIAGNOSIS.—Dorsal spines of anal, penult, and thirteenth legs 0, 0, 2, 0, 0. Ventral spines of anal leg 0, 1, 1, 1, 0, of penult 0, 1, 1, 1, 0–0, 1, 2, 1, 0; of ninth to thirteenth, 0, 0, 0, 1, 1. Dorsal spines of tenth and eleventh pairs of legs (as also of the second or third to ninth) 0, 0, 0, 1, 1.

Ocelli 5 or 6 in two series.

Prosternum 1.57 or 1.6 times wider than long. Distance between chitinous spots about 3.6 times greater than the distal line; 2.25 times longer than the width at median incision.

Coxal pores 2, 2, 2, 2–2, 3, 3, 2.

Process of tibia of penult legs in male rather long and slender, in proximal aspect with lateral lines parallel; in lateral aspect appearing thicker and projecting over base on side at distal end of article; sensory hairs long and slender.

Body 7.7 or 7.75 times longer than width of tenth plate.

Head broadly subcordate; distinctly wider than long.

First dorsal plate (in type) between 1.75 and 1.8 times wider than long.

Dorsum yellow with the caudal plates tinged with orange. Head orange, with the frontal region paler.

DESCRIPTION.—The body above is yellow with the caudal plates tinged with orange. Head orange, the frontal region paler, more yellowish. Antennae orange, yellow at tips. Prosternum orange brown. Venter pale, the caudal plates more strongly pigmented as usual. Legs pale excepting the posterior pairs which are bright orange.

Body more slender than in most related species, in the type being 7.73 times longer than the width of the tenth dorsal plate. Width of head and first, third, eighth, tenth, and twelfth plates to each other about as 36:32:35:43:44:41.

Head broadly subcordate, considerably bulging caudad of eyes. Clearly wider than long (12:11). Hairs short and sparse.

Antennae short. Articles short and very short, decreasing distad of the second as usual. Hairs short and not dense.

Eyes typically composed of five or six ocelli in two series:—thus, 1+2, 2 or 1+3, 2. Single ocellus smaller than the first one of upper row and the others of the usual relative sizes.

Prosternum in type 1.57 times wider than long. Distance between chitinous spots 3.6 times the dental line; 2.25 times width at level of bottom of median incision. Median incision of the usual semicircular form, rather small, the distance across it between the two mesal teeth not greater than that between the teeth of each pair. Teeth moderate; line of apices distinctly and considerably recurved. Spine at base of ectal tooth; slender, somewhat curved mesad distally, not exceeding the tooth in length.

First dorsal plate widest near anterior end, the sides from there at first slightly and then more strongly converging caudad; plate in type 1.77+ times wider than long. Posterior corners of the eleventh and thirteenth dorsal plates a little produced, those of the ninth straight or also showing a very slight tendency toward production, rounded; other minor plates with corners oblique or rounded.

Coxal pores very small; 2, 2, 2, 2-2, 3, 3, 2.

Spines of first legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of second,  $\frac{0, 0, 0, 0, (1), 1}{0, 0, 0, 0, 0, 0}$ ; of third,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 0}$ ; of the fourth to seventh,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the ninth to eleventh,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the twelfth,  $\frac{0, 0, 0, 0, (1), 1}{0, 0, 0, 1, 1}$ , the dorsal spine of the fifth article being on the cephalic side; of the thirteenth,  $\frac{0, 0, 2, 0, 0}{0, 0, 0, 1, 1}$ ; of the penult,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0-0, 1, 2, 1, 0}$ , claws 2; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , claws 2.

In the male the anal and penult legs are short and uniformly and but little inflated; both are laterally longitudinally sulcate. The process at the distal end of the tibia of the penult legs is rather long and slender; when viewed from proximal aspect of leg its sides appear nearly parallel; in lateral aspect the process is somewhat thicker and projects distad above its base; distal surface rising obliquely dorso-distad from its proximal end to its distal; sensory hairs long and slender. (Plate 3, fig. 1-2).

Length (type) 6.5 mm.; width of tenth plate .84 mm.; length of antennae 2 mm.

LOCALITY.—North Carolina (Hot Springs!).



## NAMPABIUS EMBIUS, sp. nov.

DIAGNOSIS.—Dorsal spines of the anal and penult legs 0, 0, 2, 0, 0. Dorsal spines of the thirteenth legs 0, 0, 2, 1, 0; ventral 0, 0, 1, 1, 1. Dorsal spines of the tenth to twelfth legs 0, 0, 0, 1, 2; ventral 0, 0, 0, 2, 1. Dorsal spines of the sixth to ninth legs also 0, 0, 0, 1, 2.

Ocelli 6 to 8 in two series.

Prosternum about 1.56 times wider than long. Distance between chitinous spots 2.14 times width at median incision;  $3\frac{1}{3}$  times the dental line.

Spines of the gonopods rather long; sides parallel or but slightly converging from base to the very short acuminate tip, the sides of which are straight and meet at an almost obtuse angle.

Body more slender than in most related species being (in type) about  $8\frac{1}{3}$  times longer than the width of the tenth dorsal plate.

Head clearly wider than long.

First dorsal plate near 1.75 times wider than long.

Dorsum brown of dilute chestnut caste. Head dark brownish red.

DESCRIPTION.—Brown of dilute chestnut caste. Head dark brownish red. Antennae brown, pale distally. Prosternum dark, more brownish than the head with the prehensorial feet paler. Venter pale brown, the caudal plates darker. Legs colored nearly like the corresponding plates of venter; posterior pairs light distad.

Body comparatively slender being in the type  $8\frac{1}{3}$  times longer than the width of the tenth plate. Widths of head and of the first, third, eighth, tenth, and twelfth plates to each other about as 39:35:38:48:49:47.5.

Head wider than long in ratio 13:12; widest behind eyes from where the convergence of the sides to the caudal corners is marked.

Antennae short as usual. Moderately attenuated. The twenty articles short and very short, decreasing regularly distad. Hairs of moderate length, short, not dense. (Plate 2, fig. 7).

Eyes composed of 6 to 8 ocelli in two series:—thus, 1+3, 3—1+4, 3—1+3, 2. Ocelli of moderate size, black.

Prosternum 1.56 times wider than long. Distance between chitinous spots 2.14 times width at level of bottom of mesal incision;  $3\frac{1}{3}$  times the dental line. Mesal incision wide and shallow, of the usual form at bottom. Teeth small, distally narrowly rounded; line of apices rather strongly recurved. Spine unusually long, bristle like.

First dorsal plate widest a little caudad of anterior end from where

the sides converge considerably; 1.75 times wider than long. Posterior corners of the thirteenth plate a little produced; those of the eleventh nearly straight and those of ninth rounded cephalad.

Coxal pores small and circular as usual, 2, 3, 3, 3.

Spines of first pair of legs,  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 0, 0}$  to  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of second and third,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of fourth and fifth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of sixth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$  or  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 0, 1}$ ; of seventh,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of tenth to twelfth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 2, 1}$ ; of thirteenth,  $\frac{0, 0, 2, 1, 0}{0, 0, 1, 1, 1}$ ; of the penult,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , claws 2; of the anal 0, 0, 2, 0, 0.

Claw of female gonopods of moderate size; distinctly tripartite. Spines rather long, with sides parallel or but slightly converging from base to acuminate apical portion which, as usual, is relatively very short with sides strictly straight and running to an almost obtuse angle. Inner side of first article of gonopod considerably diverging proximad from its fellow. Sternite mesally straight, with no distinct process.

Length (type) 7.5 mm., width of tenth plate .91 mm.; length of antenna, 2 mm.

LOCALITY.—South Carolina (Taylors!).

### NAMPABIUS INIMICUS, sp. nov.

DIAGNOSIS.—Dorsal spines of penult legs 0, 0, 2, 0, 0; ventral 0, 1, 2, 1, 0. Dorsal spines of thirteenth legs, 0, 0, 2, 1, 0; ventral, 0, 0, 2, 1, 1. Dorsal spines of twelfth legs, 0, 0, 0, 1, 2; ventral, 0, 0, 1, 2, 1. Dorsal spines of tenth and eleventh legs, 0, 0, 0, 2, 2. Ventral spines of tenth and eleventh (as also of eighth and ninth) legs, 0, 0, 0, 2, 1.

Ocelli (in type) 6 in two series.

Prosternum about 1.57 times wider than long. Distance between chitinous spots 2.1 times the width at median incision; 3.1 times as great as the dental line.

Coxal pores 2, 2, 2, 2–2, 3, 3, 2.

Body about 7.8 times longer than width of tenth dorsal plate.

Head subrotund, considerably wider than long.

First dorsal plate 1.7 times wider than long.

Process of penult legs in male small, cylindric proximally but expanded at distal end on side toward distal end of joint; sensory hairs short and spinescent. (Plate 3, fig. 5–6).

Dorsum light testaceous, the caudal plates of ferruginous tinge. Head dark orange.

DESCRIPTION.—Dorsum light testaceous, the caudal plates of ferruginous or orange tinge. Head dark orange. Antennae reddish brown, light at tips. Prosternum brown. Venter very pale, excepting the caudal plates which are orange. Legs pale like the venter, but the posterior pairs more brightly pigmented as usual.

Body more slender than typical in the genus the length of type specimen being 7.77+ times greater than the width of the tenth plate. Width of head and of first, third, eighth, tenth, and twelfth dorsal plates to each other as 39:34:37:46:47:43 (♂).

Head subrotund; considerably wider than long (39:35); the sides convexly bulging caudad of eyes; widely rounded cephalad.

Antennae moderately short. Joints short, decreasing markedly in size from the second distad. Sides of articles straight, moderately flaring distad. Hairs moderately short, not very dense.

Eyes in type composed of 6 ocelli in two series:—thus, 1+3, 2. Single ocellus of about same size as the first one of upper series or a very little smaller; others decreasing in size cephalad.

Prosternum 1.57+ times wider than long. Distance between chitinous spots 2.1 times width at level of bottom of median incision; 3.1 times the dental line. Lateral edges nearly straight or very slightly convex cephalad and slightly bending ectad at posterior end. Median incision wide, semicircular as usual; the interval between the two mesal teeth decidedly greater than that between the teeth of each lateral pair. Teeth acute; line of apices distinctly recurved.

First dorsal plate 1.7 times wider than long; widest near middle, the sides converging cephalad and, more conspicuously, caudad. Posterior angles of eleventh and thirteenth dorsal plates a little produced as usual, those of the other minor plates oblique or simply rounded.

Coxal pores very small and circular; 2, 2, 2, 2-2, 3, 3, 2.

Spines of first legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of the second,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 0}$  or  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; ventral spines of fourth and fifth, 0, 0, 0, 0, 1 and of the sixth the same or else 0, 0, 0, 1, 1; spines of seventh legs,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of eighth and ninth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 2, 1}$  of tenth and eleventh,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 2, 1}$ ; of twelfth,  $\frac{0, 0, 0, 1, 2}{0, 0, 1, 2, 1}$ ; of thirteenth,  $\frac{0, 0, 2, 1, 0}{0, 0, 2, 1, 1}$ ; of the penult,  $\frac{0, 0, 2, 0, 0}{0, 1, 2, 1, 0}$ ; anal lost.

Penult legs of male short and uniformly inflated. Process at distal

end of tibia small, cylindric at base and expanded at free end on side toward distal end of joint; process extending dorsodistad or also a little caudad; sensory hairs on distal surface of process short and spinescent. (Plate 3, fig. 5-6).

Length of type 7 mm.; width of tenth plate .9 mm.; length of antenna, 2.3 mm.

LOCALITY.—Tennessee (Russellville!).

NAMPABIUS GEORGIANUS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal and penult legs 0, 0, 2, 0, 0; ventral 0, 1, 1, 1, 0. Dorsal spines of thirteenth legs 0, 0, 2, 1, 0; ventral 0, 0, 2, 1, 1. Dorsal spines of twelfth legs, 0, 0, 1, 2; ventral, 0, 0, 0, 1, 1. Dorsal spines of eleventh legs, 0, 0, 0, 2, 2; of the tenth, 0, 0, 0, 1, 2. Ventral spines of tenth and eleventh legs (as also of the sixth to ninth) 0, 0, 0, 1, 1.

Ocelli 10-12 in three series.

Prosternum 1.5 times wider than long; distance between chitinous spots only 3.1 times as great as dental line; about  $2\frac{1}{3}$  times as great as width at median incision.

Body 6.6 to nearly 7 times longer than width of tenth dorsal plate.

Head much wider than long.

First dorsal plate twice as wide as long or nearly so.

Process of tibia of penult leg of male small and subcylindric, (Plate 2, fig. 2).

Dorsum testaceous. Head light ferruginous; frontal region palest.

DESCRIPTION.—Dorsum testaceous. Head somewhat light ferruginous with caudal portion covered with a darker brown area, leaving the frontal region palest. Antennae somewhat pale ferruginous brown, lighter at tips. Prosternum brown of more or less reddish caste, the prehensorial feet paler. Venter pale yellow, with the caudal plates darker. Legs like adjoining part of venter with caudal pairs somewhat brighter, distally.

Body strongly narrowed cephalad, moderately robust, being from 6.6 to 6.9 times longer than width of the tenth plate, being thus relatively more slender than in *N. virginensis*. Widths of head and of first, third, eighth, tenth, and twelfth plates as 37:34:38:46:48:43.

Head much wider than long (average ratio about 33.5:29.5), being wider by from  $\frac{1}{8}$ th to  $\frac{1}{10}$ th. Broadest a little back of eyes where it bulges considerably on each side. Broad anteriorly, not subcordate

as in *virginiensis*. Hairs moderately short, very sparse. (Plate 3, fig. 8).

Antennae short and but moderately attenuated. Articles, as usual, 20, which are short though rather longer than in *virginiensis* and also less closely telescoped; decreasing distad from the second. Hairs moderately short, not especially dense.

Eyes composed of ten to twelve ocelli arranged in three series:—thus 1+4, 4, 3-1+4, 3, 3. Ocelli black; closely but somewhat irregularly arranged.

Prosternum 1.5 times wider than long. Distance between chitinous spots 3.1 times as great as the length of dental line; about  $2\frac{1}{3}$  times the width at level of bottom of median incision which is clearly farther cephalad of caudal ends of lateral slopes than in *virginiensis*. Sides or slopes of anterior portion straight, slanting directly ecto-caudad from the teeth. Teeth small and acute. Median incision conspicuous, of the usual semicircular form.

First dorsal plate widest at anterior end, the sides at first moderately converging and then strongly rounding in about the caudal corners; about twice as wide as long. Ninth plate with caudal margin bent forward a little at ends. Eleventh plate with caudal margin straight all the way across or very nearly so. Thirteenth plate with caudal corners a little produced.

Coxal pores small; 2, 2, 2, 2.

Spines of first legs,  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 0, 0}$ ; of second,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ , 1; of third,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 0}$ ; of fourth and fifth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of sixth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of eighth to tenth inclusive,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of eleventh,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 1, 1}$ ; of twelfth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of thirteenth,  $\frac{0, 0, 2, 1, 0}{0, 0, 2, 1, 1}$ ; of penult and anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , each with two claws.

In the male the anal legs are short; uniformly and but little crassate. (Plate 2, fig 3). Penult legs similar to anal but bearing the characteristic lobe at distal end of the fifth joint, or tibia; lobe small and subcylindric, proportionately longer than in *virginiensis* (Plate 2, fig. 1-2); extending in a mesodorsal and somewhat distal direction, bearing on the free surface a limited number of rather short sensory hairs.

Length 5 to 6.25 mm.

LOCALITY.—Georgia (Tallulah Falls!).

## NAMPABIUS CAROLINENSIS, sp. nov.

DIAGNOSIS.—Dorsal spines of the anal and penult legs, 0, 0, 2, 0, 0; ventral of penult, 0, 1, 2, 1, 0, of anal 0, 1, 1, 1, 0. Dorsal spines of thirteenth legs, 0, 0, 2, 1, 0; ventral, 0, 0, 2, 1, 1. Dorsal spines twelfth legs, 0, 0, 1, 1, 2. Dorsal spines of tenth and eleventh legs, 0, 0, 0, 2, 2. Ventral spines of ninth to twelfth (as also of seventh and eighth) legs, 0, 0, 0, 1, 1.

Ocelli near 6 in number, in two series.

Prosternum 1.6 times wider than long. Distance between chitinous spots only 2.1 times width at median incision; 3.5 times as great as dental line.

Body near eight times longer than width of tenth plate.

Head conspicuously wider than long.

First dorsal plate near 1.7+ times wider than long.

Process of tibia of penult leg in male relatively slender and moderately long, broadening at base but not distally where it is rounded. Hairs at distal end straight and divergent. (Plate 2, figs. 4-5).

Dorsum yellowish, uniform. Head reddish orange.

DESCRIPTION.—Dorsum yellowish, uniform. Head reddish orange. Antennae brown, pale distally. Prosternum somewhat paler than head, the prehensorial feet still lighter. Venter light yellow, the caudal plates orange. Legs nearly like corresponding plates of venter.

Body moderate, being 7.9 or 8 times longer than width of tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth dorsal plates to each other as 36:31:34:42:43:41.

Head conspicuously wider than long (9:8), widely rounded in front of eyes; sides well rounded caudad of eyes. Hairs of moderate length and sparse, as usual.

Antennae short and moderately attenuated. Articles beyond the second short and very short, decreasing distad. Clothed as usual.

Eyes composed of about 6 ocelli arranged in two series:—thus, 1+3, 2. Ocelli distinct, regular in form and arrangement.

Prosternum 1.6 times wider than long. Distance between chitinous spots 2.1 times width at median incision; 3.5 times the dental line. Median incision wide and shallow, strictly semicircular in form. Teeth small, the outer of each pair rather larger than the inner, the interval between the two well rounded; line of apices strongly re-curved. Spine contiguous with base of outer tooth, fine. Lateral



margin of anterior portion beginning at spine and sloping ectocaudad; a little convex, bent ectad near caudal end for a short distance.

First dorsal plate 1.72 times wider than long; sides convex, widest a little in front of middle of length. Posterior angles of thirteenth plate a little produced; those of the eleventh slightly more so. Caudal margin of other minor plates more or less bent forwards at ends; or corners of the ninth obliquely excised.

Coxal pores small and circular; 2, 2, 2, 2.

Spines of first to third legs inclusive,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of fourth and fifth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of sixth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 0, 1}$ ; of seventh and eighth,  $\frac{0, 0, 0, 1, 2}{0, 0, 0, 1, 1}$ ; of tenth and eleventh,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 1, 1}$ ; of twelfth,  $\frac{0, 0, 1, 1, 2}{0, 0, 0, 1, 1}$ ; of thirteenth  $\frac{0, 0, 2, 1, 0}{0, 0, 2, 1, 1}$ ; of penult,  $\frac{0, 0, 2, 0, 0}{0, 1, 2, 0, 1}$ , claws; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , armed with two claws.

In the male the anal legs are short and moderately, uniformly inflated. The penult legs are similar excepting for the tibial lobe; lobe a relatively slender and moderately long cylindric process which widens at base but distally is rounded and not at all expanded; distal hairs straight and divergent.

Length of type 6.5 mm.

LOCALITY.—South Carolina (Landrum! August, 1910).

#### NAMPABIUS TENNESSEENSIS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal and penult legs 0, 0, 2, 1, 0; ventral, 0, 1, 1, 1, 0. Dorsal spines of twelfth legs, 0, 0, 2, 1, 0. Dorsal spines of tenth and eleventh legs (as also of the first to ninth), 0, 0, 0, 1, 1. Ventral spines of ninth to twelfth legs (as also of the fifth or sixth to eighth), 0, 0, 0, 1, 1.

Ocelli 8 or 9 in two or three series.

Prosternum 1.54 times wider than long. Distance between chitinous spots  $2\frac{1}{3}$  times width at median incision; 3.5–3.8 times the dental line.

Body eight times longer than width of tenth plate.

Head wider than long.

Process of tibia of penult legs of male flattened in a distoectal proximomesal direction; considerably longer along base than the height above same; expanded at distal end. (Plate 3, fig. 3–4).

Dorsum pale chestnut. Head darker chestnut, shining.

DESCRIPTION.—Dorsum pale chestnut. Head a deeper, shining

chestnut. Antennae chestnut, excepting the tips which are lighter. Prosternum rather more brownish than the head, with the preensorial feet lighter and at tips somewhat light ferruginous. Venter pale; the anterior plates suffused with purplish; the caudal plates burnt brown. Legs pale, excepting the posterior pairs which are brown or brownish orange.

Body moderate, in the male type being near eight times longer than wide. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 36:30:32:41:42:40.

Head wider than long in ratio 12:11; not varying much in width between eyes and level of marginal breaks; broadly rounded cephalad. Hairs short and sparse.

Antennae short as in related species. Moderately attenuated. Articles short, decreasing distad. Hairs on proximal articles rather sparse, becoming denser distad.

Eyes composed of eight or nine ocelli arranged in two or three series:—thus, 1+4, 3; 1+3, 3, 2; 1+4, 3, 1.

Prosternum 1.54 times wider than long. Distance between chitinous spots  $2\frac{1}{3}$  times the width at level of bottom of median incision; 3.8–3.5 times the dental line. Median incision wide and shallow, sides strongly converging, rounded at bottom. Teeth moderately small, acute; line of bases forming a strongly reentrant angle and the line of apices accordingly recurved. Sides of anterior portion sloping immediately from the outer teeth, straight, slanting more strongly ectad than usual.

First dorsal plate widest near the middle, from where the sides are subparallel cephalad and rather strongly converging caudad. Caudal angles of eleventh and thirteenth dorsal plates a little produced in the typical manner; those of the ninth straight or a little oblique.

Coxal pores small and circular, the proximal ones in each series somewhat smaller than the distal; 2, 2, 2, 2 or 2, 3, 3, 2.

Spines of first legs,  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 0, 0 \end{smallmatrix}$ ; of the second,  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 0, 0 \end{smallmatrix}$ ; of the third and fourth,  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 0, 1 \end{smallmatrix}$ ; of the fifth,  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 0, 1 \end{smallmatrix}$  or  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 1, 1 \end{smallmatrix}$ ; of the sixth to eleventh,  $\begin{smallmatrix} 0, 0, 0, 1, 1 \\ 0, 0, 0, 1, 1 \end{smallmatrix}$ ; of the twelfth,  $\begin{smallmatrix} 0, 0, 2, 1, 0 \\ 0, 0, 0, 1, 1 \end{smallmatrix}$ ; of the thirteenth,  $\begin{smallmatrix} 0, 0, 2, 1, 0 \\ 0, 0, 1, 1, 1 \end{smallmatrix}$ ; of the penult,  $\begin{smallmatrix} 0, 0, 2, 0, 0 \\ 0, 1, 1, 1, 0 \end{smallmatrix}$ , claws 2; of the anal,  $\begin{smallmatrix} 0, 0, 2, 0, 0 \\ 0, 1, 1, 1, 0 \end{smallmatrix}$ , claws 2.

Anal legs of the male short; uniformly and but little thickened. Penult legs as usual; lobe or process extending dorsocaudo-distad, flattened in a distoectal and proximo-mesal direction, considerably



longer along line of attachment than its height above surface of joint, at distal end expanded over proximal portion, hairs at distal end of process as usual. (Plate 3, fig. 3-4).

Gonopods of male broad but very short, rounded; bearing two bristles.

Length of male type, 6.25 mm.; width of tenth plate, .78 mm.; length of antennae 1.75 mm.; of anal legs, 2 mm.

LOCALITY.—Tennessee (Russellville!).

#### NAMPABIUS LONGICEPS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal and penult legs 0, 0, 2, 0, 0; ventral, 0, 1, 1, 1, 0. Dorsal spines of thirteenth legs, 0, 0, 2, 1, 0; ventral 0, 0, 1, 1, 1. Dorsal spines of twelfth legs 0, 0, 2, 1, 1—0, 0, 1, 1, 1. Dorsal spines of eleventh legs, 0, 0, 0, 0, 1; of tenth (as also of the second to ninth), 0, 0, 0, 1, 1. Ventral spines of ninth to twelfth pairs of legs (as also of the fourth or fifth to eighth), 0, 0, 0, 1, 1.

Ocelli 7 or 8 in two series.

Prosternum about 1.48 times wider than long. Distance between chitinous spots 2.15 times the width at median incision; 3.5 times the dental line.

Median lobe of claw of female gonopods but little longer than the lateral. Spines wide with the sides parallel from base to the very short, acuminate distal portion.

Body slender, being 8.5 times longer than the width of the tenth plate.

Head only slightly wider than long, less rotund than in *N. lulae*.

First dorsal plate 1.8+ times wider than long.

Dorsum testaceous with anterior and posterior plates darker. Head reddish or chestnut.

DESCRIPTION.—Dorsum testaceous, with the anterior and the posterior plates darker. Head reddish or chestnut. Antennae brown, pale at tips. Prosternum brown. Venter very pale, with the caudal plates darker and the anterior ones strongly suffused with violaceous. Legs pale like the venter, the posterior pairs darker brown.

Body comparatively slender being about 8.5 times longer than width of tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 36:30:33:41:41:39.

Head only slightly wider than long (36:35); less rotund than in *lulae*. Hairs moderate in length, few.

Antennae very short, reaching only the fourth or fifth segment. Articles short and very short, decreasing distad as usual. Hairs of moderate length, rather sparse proximally, becoming more dense distad.

Ocelli 7 or 8; arranged in two series:—thus, 1+3, 3; 1+4, 3.

Prosternum 1.48—times wider than long. Distance between chitinous spots 2.15 times the width at level of median incision; 3.5 times as great as the dental line. Teeth subequal, acute, with sides nearly straight but with interval on each side narrowly rounded at the bottom; line of apices recurved. Median incision well rounded at bottom as usual; but the sides more nearly straight and less converging. Sides of anterior portion but slightly convex, sloping ectocaudad immediately from base of spine.

First dorsal plate widest near anterior end; the sides moderately converging caudad; 1.8 times wider than long. Thirteenth plate with caudal angles a little produced; but the eleventh and ninth with posterior margin straight all the way across or nearly so, or the eleventh showing a tendency for the angles to be weakly produced.

Coxal pores very small; 2, 3, 3, 3.

Spines of the first legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of the second,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 0}$ ; of the third,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the fourth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$  or  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the fifth to tenth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the eleventh,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 1, 1}$ ; of the twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 0, 1, 1}$  or  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the thirteenth,  $\frac{0, 0, 2, 1, 0}{0, 0, 1, 1, 1}$ ; of the penult and anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , with two claws.

Claw of the gonopods of female short, moderately curved, tripartite; lobes short and acute, the median being but little longer than the lateral. Basal spines wide with sides parallel from base to the acuminate distal portion which is relatively very short with its straight sides converging to an almost obtuse angle, its outer side being longer than its inner. Inner side of first article of gonopods a little convex distally and slightly concave proximally, subparallel with its fellow.

Length of type 6.5 mm.; of antenna, 1.9 mm.; of anal leg, 1.8 mm.; width of tenth dorsal plate, .76 mm.

LOCALITY.—North Carolina (Asheville!).

#### NAMPABIUS LULAE, sp. nov.

DIAGNOSIS.—Dorsal spines of anal and penult legs, 0, 0, 2, 0, 0; ventral, 0, 1, 1, 1, 0. Dorsal spines of thirteenth legs, 0, 0, 2, 1, 1; ventral, 0, 0, 0, 1, 1—0, 0, 1, 1, 1. Dorsal spines of twelfth legs,

0, 0, 2, 1, 1; of the eleventh, 0, 0, 0, 0, 1; of the tenth (as also of second to ninth), 0, 0, 0, 1, 1. Ventral spines of ninth to twelfth pairs of legs (as also of the sixth to eighth), 0, 0, 0, 1, 1.

Ocelli 7 to 11 in 2 or 3 series.

Prosternum 1.55+ times wider than long. Distance between chitinous spots 2.1 times the width at median incision; 3.5 times the dental line.

Body about seven times longer than the width of tenth plate.

Head subrotund; wider than long.

First dorsal plate 1.75 times wider than long.

Dorsum rather dark brown, in some of reddish caste. Head deep reddish brown or almost black.

DESCRIPTION.—Dorsum rather dark brown, which may be somewhat reddish in caste. Head deep reddish brown or almost black. Antennae dark brown proximally, pale at tips. Prosternum brown, the prehensorial feet considerably lighter in shade. Venter dilute greyish brown to light brown, the caudal plates darker brown as usual and the anterior segments commonly distinctly suffused with violaceous. Legs like corresponding portion of venter, the posterior pairs being thus darker, brown, paler distally.

Body seven times, a little more or less, longer than the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 37:31:34:42:44:42.

Head subrotund, wider than long in ratio 35.5:33.5. Hairs moderately short, sparse.

Antennae short, only moderately attenuated. Articles short, decreasing distad as usual. Hairs of moderate length, not especially dense.

Eyes each composed of from 7 to 12 ocelli in two or three series:—thus, 1+4, 4, 2; 1+4, 4, 1; 1+3, 3; 1+4, 3. Single ocellus relatively large.

Prosternum 1.55+ times wider than long. Distance between chitinous spots 2.1 times width at level of bottom of median incision; 3.5 times the dental line. Teeth small and acute; line of apices clearly recurved; interval between teeth of each pair angular. Median incision relatively wide, semicircular, being widely curved at bottom and with sides considerably converging. Spine moderately stout at base, long and acutely, finely acuminate as usual; parallel with ectal edge of outer tooth. Lateral slopes beginning at spine and extending directly ectocaudad.

First dorsal plate 1.75 times wider than long; sides from middle to anterior end nearly straight and parallel; caudad of middle strongly

convexly rounding in mesad about the caudal corners. Ninth plate with its caudal margin straight or a little bent forwards at ends. The eleventh and thirteenth plates with posterior corners only slightly produced caudad.

Coxal pores small; on distal portion of coxa; in number 2, 2, 2, 2, mostly.

Spines of first legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 0}$ ; of second,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 0}$ ; of third to tenth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ , the dorsal spines on tenth legs being on anterior side of joint; of twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 0, 1, 1}$ , the dorsal spine of fourth article being posterior and that of fifth joint anterior in position; of thirteenth,  $\frac{0, 0, 2, 1, 1}{0, 0, 0, 1, 1} - \frac{0, 0, 2, 1, 1}{0, 0, 1, 1, 1}$ , the two single dorsal spines situated on posterior side; of penult and anal legs,  $\frac{0, 0, 2, 0, 0}{0, 1, 1, 1, 0}$ , each with two claws.

Anal and penult legs of male short and moderately, uniformly inflated; fourth joint longitudinally sulcate above, the third and fifth less distinctly so. Process of penult legs present in usual position.

Gonopods of male each extending somewhat ectocaudad, the mesal side being very long and convex and the ectal relatively very short, bearing two (or one) bristles.

Length from 5 to 6.5 mm. A male 6 mm. long has antenna 2 mm. long; anal leg 1.8 or 1.9 mm. long; and the tenth plate .87 mm. wide.

TYPE LOCALITY.—Georgia (Lula).

KNOWN LOCALITIES.—Georgia (Lula!); Tennessee (Johnson City! Russellville!).

### NAMPABIUS LUNDII (MEINERT).

*Lithobius lundii* Meinert, Myriap. Mus. Haumensis, 1886, 3, p. 12.

DESCRIPTION.—The original description, somewhat rearranged, is as follows:

Brunneus, capite cum antennis obscuriore, subtus pallidiore, pedibus flavis.

Sat gracilis, sublaevis.

Capite suborbiculare, fere aeque longo ac lato.

Antennae breviusculae, 19-articulatae, articulis longiusculis.

Oculi ocellis 6-7, in series 3 digestis.

Dentes prosternales bini.

Laminae dorsales omnes angulis rectis.

Pori coxales 2, 3, 3, 2, rotundi, parvi vel perparvi.

Pedes corporis primi paris calcaribus 0, 0, 1; pedes anales calcaribus 1, 1, 1, 0 armati, unguibus binis; pedes penultimi paris unguibus binis armati. Pedum analium coxae inermes.

Pedum penultimorum tibiae in angulo interno appendice parvo nodiformi instructae.

Pedes postici breviusculi, crassiusculi.

Long. (maris) 6.5 mm.

LOCALITY.—Near New York City (L. Lund): the type is in the Museum at Copenhagen.

### GARIBIUS, gen. nov.

Body considerably narrowed from the tenth segment cephalad to the first, the dorsal plate of which is much narrower than the head a little narrower than that of the third segment. Moderate to slender, the length varying from 7.5 to 9.5 times the width of the tenth plate. Varying from 5 to 9.5 mm. in length.

Antennae short; uniformly composed of twenty articles.

Ocelli in three or, less commonly, in two series; 6 to 14 in number. Single ocellus typically not larger than the others.

Prosternal teeth 2+2; line of apices straight or but little recurved. Median incision v-shaped, strictly angular at bottom.

Posterior angles of none of the dorsal plates produced.

Claw of the female gonopods in all known species tripartite. Basal spines 2+2, slender. Mesal side of first article nearly straight.

Coxal pores small and circular; uniseriate; from 2, 3, 3, 2 to 3, 4, 4, 3.

Dorsal spines of the anal legs 1, 0, 2, 0, 0 or rarely 1, 0, 2, 1, 0; ventral, 0, 1, 3, 1, 0; claw 1. Dorsal spines of penult legs 1, 0, 2, 1, 0 or 1, 0, 2, 1, 1; ventral, 0, 1, 3, 2, 1; claws 3. Dorsal spines of thirteenth legs, 1, 0, 2, 1, 1; ventral, 0, 1, 3, 3, 2 to 0, 0, 2, 3, 2. Dorsal spines of twelfth legs, 1, 0, 2, 1, 1 or 0, 0, 0, 2, 2 to 1, 0, 2, 1, 2. Dorsal spines of eleventh legs 0, 0, 2, 1, 1 or 0, 0, 0, 2, 2 to 1, 0, 2, 1, 2; ventral, 0, 0, 0, 2, 1 to 0, 0, 2, 3, 2. Dorsal spines of first legs 0, 0, 1, 1, 1 to 0, 0, 2, 2, 1; ventral, 0, 0, 0, 2, 1 to 0, 0, 1, 2, 1. Last three or four pairs of coxae thus dorsally armed; while rarely none of the coxae are laterally armed, in most those of the last pair are, and those of the last two pair may be.

Anal legs of male moderately thickened; tibia always bearing at distal end on dorsomesal side a low crest bearing sensory setae

(Plate 4, fig. 6, 7, 9) much as in the genus *Nadabius* (*collium* Chamb., *iowensis* Mein., and allies). The tibia of the penult legs may or may not show a more weakly developed similar crest.

TYPE.—*G. monticolens*, sp. nov.

DISTRIBUTION.—Southeastern States and northward to Pennsylvania and New Jersey.

These forms seem particularly to prefer to live under the bark of fallen trees.

NOTE.—In my paper on the Lithobiomorpha of the Southeastern States (Ann. Ent. soc. America, 1911, 4, p. 32–50) several of the species now described were placed together under the name *Lithobius branneri* Bollman, the several forms being considered tentatively as varieties.

The following key is given as an aid in the identification of the species.

*Key to species of Garibius.*

- a. Dorsal spines of anal legs 1, 0, 2, 1, 0. *G. eataurbae*, sp. nov.
- aa. Dorsal spines of anal legs 1, 0, 2, 0, 0.
  - b. First seven or more pairs of legs with the third joint ventrally unarmed.
    - c. Third joint of all legs dorsally armed; none of the coxae laterally armed; dorsal spines of penult legs 1, 0, 2, 1, 0; of the twelfth, 0, 0, 2, 1, 1 or 1, 0, 2, 1, 1. *G. georgiae*, sp. nov.
    - cc. Third joint of first ten or more pairs of legs dorsally unarmed; last pair of coxae laterally armed; dorsal spines of penult legs 1, 0, 2, 1, 1; of the twelfth 0, 0, 2, 2, 2.
      - G. alabamiae*, sp. nov.
  - bb. All legs, or all excepting the first pair, with the third joint armed both dorsally and ventrally.
    - c. Last two pairs of coxae laterally armed.
      - d. Ventral spines of second to sixth legs 1, 3, 1; of 1st, 1, 2, 1, with the dorsal 2, 1, 1; head equal in length and breadth. *G. pagoketes*, sp. nov.
      - dd. Ventral spines of second to seventh legs 1, 2, 1; of first 0, 2, 1, with the dorsal 1, 1, 1; head distinctly wider than long. *G. mississippiensis*, sp. nov.
    - cc. Either none, or only the last pair, of coxae laterally armed.
      - d. None of the coxae laterally armed; dorsal spines of the eleventh legs 2, 1, 2, the ventral 1, 3, 2; ventral spines of the first legs 1, 3, 2. *G. dendrophilus*, sp. nov.

- dd. Last pair of coxae laterally armed; dorsal spines of eleventh legs 2, 1, 1, ventral 2, 3, 2 or 3, 3, 2; ventral spines of first legs, 1, 2, 1 or 1, 3, 1.
- e. Ventral spines of eleventh and twelfth legs 2, 3, 2; of second to sixth, 1, 3, 2. *G. opicolens*, sp. nov.
- ee. Ventral spines of eleventh and twelfth legs 3, 3, 2; of second to sixth 1, 3, 1. *G. monticolens*, sp. nov.

GARIBIUS CATAWBAE, sp. nov.

DIAGNOSIS.—Dorsal spines of anal and of penult legs, 1, 0, 2, 1, 0. Ventral spines of thirteenth legs, 1, 3, 3, 2 or 1, 2, 3, 2. Dorsal spines of twelfth legs, 0, 0, 2, 1, 1; ventral, 0, 0, 2, 3, 2. Dorsal spines of eleventh legs, 0, 0, 2, 2, 2; ventral, 0, 0, 2, 3, 2. Dorsal spines of first legs, 0, 0, 2, 1, 1; ventral, 0, 0, 1, 2, 1. Third joint of all legs dorsally and also ventrally armed. Last pair of coxae laterally armed.

Antennae as usual.

Ocelli about 14 in three series.

Prosternum 1.65 times wider than long. Distance between chitinous spots 2.7 times the width at median incision; 3.78 times the dental line. Median incision strictly V-shaped.

Coxal pores 3, 4, 4, 3.

Body about 8.4 times longer than width of tenth plate.

Length (of type) 8 mm.

First dorsal plate 1.73 times wider than long.

Anal legs in the male with the usual crest. (Plate 4, fig. 8-9). Penult legs with the tibia also bearing a sharp longitudinal ridge along dorsocaudal side the form of which at its distal end is somewhat suggestive of the crest of the anal leg.

Dorsum light chestnut; head scarcely darker.

DESCRIPTION.—Light chestnut above. Head scarcely darker. Antennae in color like the head, pale at tips.

Prosternum light brown, with the prehensorial feet paler. Venter pale, the caudal plates darker, burnt brown. Legs pale, with tarsi most pigmented; posterior pairs darker, brown or pale chestnut, lighter distally.

Body of usual form. Length about 8.4 times width of the tenth dorsal plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 45:40:42:49:50:44.

Head of equal width and length or very nearly so. Nearly of uni-



form width between eyes and marginal breaks; narrowed rather more than usual cephalad.

Antennae short. Composed of the usual twenty articles which are short, articles more loosely united distally.

Eyes composed of about 14 ocelli arranged in three series:— thus, 1+5, 4, 4.

Prosternum 1.65 times wider than long. Distance between chitinous spots 2.7 times width at level of bottom of median incision; 3.78 times the length of dental line. Mesal incision strictly V-shaped, the sides being straight and meeting in an acute angle at bottom. Teeth acute, with their sides straight; the interval between each pair subacute at bottom or but narrowly rounded; inner tooth distinctly larger than the outer; line of apices straight or very nearly so. Lateral slope beginning at outer tooth; convex for entire length, most strongly so near its middle.

First dorsal plate with sides convex anteriorly; widest a little back of anterior end from where to the rounded caudal corners the sides are nearly straight and converge conspicuously; about 1.73 times wider than long. Posterior corners of ninth, eleventh, and thirteenth dorsal plates simply rounded.

Coxal pores small, regularly decreasing proximad on each coxa; in number, 3, 4, 4, 3.

Spines of first legs,  $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 1}$ ; of the second to sixth,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 1}$ ; of seventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$ ; of eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of tenth and eleventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 3, 2}$  or  $\frac{1, 0, 2, 1, 1}{0, 1, 2, 3, 2}$ ; of penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , claws 3; of the anal,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 1, 0}$ ; claw single. Coxae of anal legs laterally armed.

Anal legs of male moderately crassate, with the tarsi more or less abruptly more slender than the tibia, tibia at distal end with dorsomesal corner flattened and there bearing the typical low ridge or crest. Dorsomesal edge of crest forming almost a straight line, at distal end convex; bearing a number of moderately long hairs. (Plate 4, fig. 8-9). Joints longitudinally sulcate above and laterally. Penult legs with tibia bearing a sharp longitudinal ridge along dorsocaudal side, this at distal end in appearance suggestive of the crest of anal legs.

Length of type ( $\sigma^7$ ) 8 mm.; length of antennae, 2.5 mm.; of anal legs also near 2.5 mm.; width of tenth plate, .95 mm.

LOCALITY.—North Carolina (Catawba!).



## GARIBIUS MONTICOLENS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs 1, 0, 2, 0, 0. Dorsal spines of penult legs 1, 0, 2, 1, 0. Ventral spines of thirteenth legs, 0, 1, 3, 3, 2. Dorsal spines of twelfth legs, 1, 0, 2, 1, 1; ventral, 0, 0, 3, 3, 2. Dorsal spines of eleventh legs, 0, 0, 2, 1, 1; ventral, 0, 0, 3, 3, 2. Dorsal spines of first legs, 0, 0, 2, 2, 1; ventral, 0, 0, 1, 2, 1. All legs with third joint armed both dorsally and ventrally. Last pair of coxae laterally armed.

Antennae of usual form. (Plate 4, fig. 3).

Ocelli about 14 in three series. (Plate 4, fig. 4).

Prosternum 1.53 times wider than long. Distance between chitinous spots 2.38 or 2.4 times width at median incision; 3.58 times length of dental line. (Plate 4, fig. 1-2).

Anal leg of male moderately inflated; tarsi abruptly more slender; tibia bearing a crest in the usual position, this clothed with a subdense series of long hairs. (Plate 4, fig. 6-7). Penult legs without lobes.

Body slender; 9.5 times as long as width of tenth plate.

Head cordate; equal in length and width or nearly so.

First dorsal plate 2.5 to 2.6 times wider than long.

Dorsum light brown. Head dilute ferruginous brown or somewhat orange with frontal region paler.

DESCRIPTION.—Above, light brown. Head dilute ferruginous brown or somewhat orange, with the frontal region paler. Antennae light brown, paler distad as usual. Prosternum lighter than head. Venter pale testaceous; the caudal plates more deeply pigmented, more or less orange. Legs pale testaceous with the tarsi more pigmented, the posterior pairs darker, brownish.

Body slender, being nearly 9.5 times longer than the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 54:46:47:54:56:55.

Head cordate. Equal in length and width or very nearly so. Nearly constant in width between level of eyes and that of lateral breaks or a little caudad of then.

Antennae short. Composed of the usual twenty articles, these being loosely joined. (Plate 4, fig. 3).

Eyes consisting of about 14 ocelli arranged in three series:—thus, 1+5, 5, 3. Single ocellus oval. Ocelli of upper series, especially the more caudal ones, conspicuously larger than the other ones, the ocelli decreasing in size cephalad and ventrad. (Plate 4, fig. 4).

Prosternum 1.53 times wider than long. Distance between chitinous spots 2.38–2.4 times width at level of bottom of median incision; 3.58 times length of dental line. Mesal incision v-shaped, with sides nearly straight. Teeth acute, the mesal one larger than the ectal; line of apices straight or slightly recurved. Spine considerably stouter at base than the hairs, slender distally, of moderate length. Lateral slopes convex cephalad, concave and bending ectad caudally. (Plate 4, fig. 1–2).

First dorsal plate widest a little caudad of the anterior end from where the sides are nearly straight and moderately converging to the rounded posterior corners; 2.5 to 2.6 times wider than long. Posterior angles of ninth, eleventh, and thirteenth dorsal plates simply rounded, with no tendency toward production.

Coxal pores small and circular; on each coxa decreasing regularly proximad.

Spines of first legs,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 2, 1}$ ; of second to fifth,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 1}$ ; of sixth,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$ ; of seventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of ninth and tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of the eleventh,  $\frac{0, 0, 2, 1, 1}{0, 0, 3, 3, 2}$ ; of the twelfth,  $\frac{1, 0, 2, 1, 1}{0, 0, 3, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , with three claws, of which the anterior is often very small, sometimes spine of coxa is doubled, making the dorsal formula thus 2, 0, 2, 1, 0; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$  the claw single, long.

Anal legs of male moderate in length, moderately inflated distad to the tarsus which is abruptly more slender; tibia obliquely complanate at distal end on mesal side toward dorsal surface and there bearing a low subtriangular crest, the elevated end of which is caudad, its mesal, gently convex edge gradually resuming the level of the joint proximad, the crest bearing a subdense series of moderately long hairs which tend to be somewhat curved caudad at their distal ends (Plate 4, fig. 6–7). Penult legs more slightly thickened, without special lobes. Third, fourth, and fifth joints of both anal and penult legs longitudinally sulcate dorsally.

Length of male type 9.5 mm.; width of tenth plate 1.07 mm.; length of antenna, 3.5 mm.; of anal leg also 3.5 mm.

TYPE LOCALITY.—Tennessee (Unaka Springs!).

LOCALITIES.—Tennessee (Unaka Springs!); North Carolina (Ashville! Brown's Summit!).

## GARIBIUS OPICOLENS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs 1, 0, 2, 0, 0; of penult 1, 0, 2, 1, 0. Ventral spines of thirteenth legs, 0, 1, 3, 3, 2. Dorsal spines of twelfth legs, 1, 0, 2, 1, 1, ventral, 0, 0, 2, 3, 2. Dorsal spines of eleventh legs, 1, 0, 2, 1, 1; ventral, 0, 0, 2, 3, 2. Dorsal spines of first legs, 0, 0, 2, 2, 1; ventral, 0, 0, 1, 2, 1, or 0, 0, 1, 3, 1. Third joint of all legs armed both dorsally and ventrally. Last pair of coxae laterally armed.

Brown to light chestnut; head subferruginous, dusky caudad of suture.

Body moderate, being about 8.25 times longer than width of tenth plate.

Head broadly subcordate, nearly equal in length and breadth.

Eyes composed of from thirteen to fifteen ocelli in three series.

Prosternum 1.54 times wider than long, as in *G. monticolens*.

Penult legs without lobes; anal legs moderately inflated with the tarsi abruptly more slender, and the tibia bearing the usual crest which is nearly as in *monticolens*.

Gonopods of female with claw short and wide, tripartite, outermost lobe smallest; outer spine considerably longer than the inner on each side, sides of spines subparallel to the short and abruptly acuminate distal portion.

DESCRIPTION.—Dorsum brown to light chestnut, with nearly always a blackish median longitudinal stripe for all or most of length while two or more of the most anterior plates may be margined, caudally with blackish; fifteenth plate abruptly lighter, yellowish or light orange. Head subferruginous, dusky caudad of suture with a blackish median spot or stripe on caudal portion. Antennae dark proximally, orange or rufous distad. Prosternum orange or light ferruginous. Venter brown, the last plate orange like the corresponding dorsal one, with the immediately preceding one or two also often lighter. The posterior pairs of legs more densely pigmented as usual, the distal joints being light orange.

Body of moderate build, being about 8.23 to 8.26 times longer than width of tenth dorsal plate.

Head broadly subcordate. Equal in length and breadth or very slightly longer (49:48). Widest just caudad of the marginal breaks from where the sides converge slightly cephalad to the eyes.

Antennae short. The twenty articles short, of uniform proportions,

moderately compactly joined, being less loose than in types of *monticolens*; ultimate article long and pointed. Hairs rather long, straight.

Eyes composed mostly of from thirteen to fifteen ocelli arranged in three series:—thus, 1+5, 4, 3; 1+5, 4, 4; 1+5, 5, 4. The single ocellus is typically broad and may be materially the largest; of the others those of the dorsal series are materially the largest, these decreasing in size cephalad.

Prosternum cir. 1.54 times wider than long. Distance between chitinous spots 2.4 times width at level of median incision; 3.78+ times the dental line. Outer tooth of each pair smaller than the inner one, both subacute; line of apices very slightly recurved. Interval between teeth of each pair semicircular. Sides of median incision straight, the bottom well rounded. Ectal spine materially stouter at base than neighboring bristles, rapidly acuminate to about middle of length, distad of where it is bristle-like; straight and moderately long.

Coxal pores circular and small; nearly uniform in size or the most proximal on coxa reduced. Common formulae are these: 3, 4, 4, 3; 4, 4, 4, 3; 4, 5, 4, 3; 4, 5, 4, 4; 4, 5, 5, 4.

Spines of first legs,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 2, 1}$  or  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 1}$ ; of the second to sixth pairs,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 2}$ ; of the seventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of the eighth to tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of the eleventh and twelfth,  $\frac{1, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , with three claws, of which the accessory ones are small but distinct; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claw single, long. The median ventral spines of legs especially long. In one specimen the inner ventral spine of prefemur of both penult legs is bifid for about half of length. Coxae of anal legs laterally armed.

Anal legs of male of moderate length, considerably longer than the penult; moderately inflated, with the tibia a little clavately widening distad and the tarsal joints abruptly more slender; tibia at distal end with dorsomesal surface obliquely complanate and there bearing the usual crest, the free edge of which toward caudal end is convex and somewhat lowering distad but materially less so than the general surface of joint and sides of crest; crest bearing a series of hairs which are straight or with some of them a little bent caudad at ends, these hairs more slender than bristles of other parts of joint; the crest very similar to that of *monticolens*, see Plate 4, fig. 6-7. Penult leg of male also moderately inflated, without any crest or special lobe. Prefemur, femur and, less distinctly, the tibia of anal and penult legs longitudinally dorsally sulcate.

The single article of the gonopods of male small but well exposed. Distally obliquely subtruncate. Bearing on distal surface mostly two long bristles.

Claw of female gonopods short and relatively wide; tripartite, the divisions acute and rather longer than usual, the middle lobe but slightly longer than the inner one, the outer one considerably shorter and more slender. Basal spines with outer one of each pair conspicuously longer than the inner; sides of spines subparallel or slightly diverging from base to the acuminate distal portion which is very short, occupying about one fourth of the total length, its sides strongly converging, its apex narrowly rounded; a denticle usually manifest on margin at beginning of acuminate portion on each side.

Length 8 to 11 mm. A specimen 10.5 mm. in length has antennae 2.6 mm. long and anal legs 3.5+ mm. long.

*Immaturus*.—Body pale yellow or dilute brown tinged with violaceous. Head yellow or pale orange. Anal legs whitish to yellow. Antennae pale yellow.

Antennae very short. Articles twenty, these distad of the fourth or fifth being very short, proportionately more so than in the adult, closely compacted. Hairs long, not dense.

Eyes composed of six to eight ocelli arranged in two series:—thus, 1+3, 2; 1+3, 3; 1+4, 3. Ocelli pale. Single ocellus somewhat largest; caudal two of dorsal row large, subequal the most anterior and those of the lower row reduced.

Prosternum practically as in the adult as regards the form and relations of teeth and ectal spines. Teeth pale.

Coxal pores small, with the most proximal one on each coxa only very slightly smaller than the distal one; 2, 2, 2, 2.

Spines of first legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$  or  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 1, 1}$ ; of the second to fifth pair,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; or  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 1, 1}$ ; of the sixth,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$  to  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the seventh,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$  to  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$ ; of the eighth,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 1, 1}$  to  $\frac{0, 0, 1, 2, 1}{0, 0, 1, 2, 1}$ ; of the ninth,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$  to  $\frac{0, 0, 1, 2, 1}{0, 0, 1, 2, 1}$ ; of the tenth,  $\frac{0, 0, 1, 1, 1}{0, 0, 1, 2, 1}$  to  $\frac{0, 0, 1, 1, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 1, 1, 0}{0, 0, 1, 2, 1}$  to  $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 1}$ ; of the thirteenth,  $\frac{0, 0, 2, 1, 0}{0, 0, 1, 2, 1}$  or  $\frac{1, 0, 2, 1, 0}{0, 1, 2, 2, 1}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ ; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ . Anal coxae armed laterally as in the adult.

Claw of female gonopods very small and weak, consisting of a single pointed process or with the lateral divisions indicated as slender

spinous points at base of the median process. Either two or three articles present. Basal spines 1+1; slender and acutely acuminate from base distad.

Length 4.75 to 5.75 mm.

*Agenitalis* I.—Body very pale, suffused with violaceous. Head, prehensorial feet and prosternum light orange. Antennae dilute yellow. Legs almost without pigment excepting the caudal pairs which are yellow.

Antennae composed of seventeen articles. Distally submoniliform. Bristles long, subsparse.

Ocelli four in two series:—thus, 1+2, 1. The single ocellus smaller than the caudal, one of the upper series; the two ocelli of upper series well separated.

Prosternal teeth and spines of nearly same form and relations as in the adult.

Coxal pores 1, 1, 1, 1.

Anal glands still evident.

Length cir. 4 mm.

TYPE LOCALITY.—New Jersey (Masonville!).

LOCALITIES.—New Jersey (Masonville! Camden! Westfield!); Pennsylvania (Upsal! Philadelphia!).

In New Jersey this species is found occurring commonly under the bark of fallen trees in pine woods.

This form is evidently very close to *monticolens* with which the first inclination was to unite it; but the examination of a considerable number of specimens from the localities above listed showed no variation in a number of differences presented. The most definite and readily usable difference is in the spining of the eleventh and twelfth pairs of legs, the formula for the ventral surface of which in *monticolens* is 0, 0, 3, 3, 2 whereas in all specimens of *opicolens* examined it is uniformly 0, 0, 2, 3, 2. A larger number of the posterior coxae are dorsally armed, but this in other species is subject to considerably variation so that it may not prove of distinctive value in the present case. *Garibius opicolens* is more robust and also presents well marked differences in color and color-pattern from that shown by the individuals of *monticolens* thus far observed.

#### GARIBIUS DENDROPHILUS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs, 1, 0, 2, 0, 0; of the penult, 1, 0, 2, 1, 0. Ventral spines of the thirteenth legs, 0, 0, 3, 3, 2. Dorsal



spines of the twelfth legs, 1, 0, 2, 1, 1; ventral, 0, 0, 2, 3, 2. Dorsal spines of the eleventh legs, 0, 0, 2, 1, 2; ventral, 0, 0, 1, 3, 2. Dorsal spines of the first legs, 0, 0, 2, 2, 1; ventral 0, 0, 1, 3, 2. None of the coxae laterally armed.

Ocelli mostly near twelve, in three series.

Prosternum cir. 1.46 times wider than long.

Penult legs of male without lobes and the crest of tibia of anal legs almost obsolete.

Head subcordate; wider than long.

Robust, in type not fully seven times longer than width of tenth plate.

Dorsum reddish brown, with caudal margins of plates darkened; head light ferruginous, darker along caudal portion.

DESCRIPTION.—Dorsum reddish brown, somewhat darker along caudal borders of plates; last two plates brighter, more reddish in color. Head light ferruginous, darker across caudal portion. Prosternum yellow ferruginous, the prehensors being yellow. Antennae yellow proximally and more or less violaceous brown elsewhere excepting at very tip which is again lighter. Venter light brown of violaceous tinge; the anterior plates somewhat darker, more reddish, and the posterior ones decidedly darker, subferruginous. Legs pale; the anal and penult pairs bright yellow excepting at bases.

Body considerably more robust than in *G. monticolens* and *opicolens*, in the type being not fully seven times as long as width of tenth dorsal plate.

Head subcordate. Widest at or a little in front of marginal breaks between which and the eyes the sides are convex; sides converging from breaks caudad about the well rounded corners to the caudal margin which is straight or slightly incurved. Anterior margin between eyes substraight, crenately indented a little each side of median line. Hairs of moderate length; sparse. Wider than long about in ratio 58:55.

Antennae rather short; 2.75— times longer than the head. Composed of the usual twenty articles which decrease uniformly in diameter and length distad; rather loosely joined; ultimate article relatively shorter than in *monticolens* and *opicolens*. Hairs long and straight, of moderate denseness.

Eyes consisting mostly of about twelve ocelli arranged in three series: — thus, 1+5, 4, 2; 1+5, 3, 2. Single ocellus largest.

Prosternum cir. 1.46 times wider than long. Distance between chitinous spots nearly three times (in type 2.9—) as great as width at

level of bottom of median incision; 3.84 times the length of the dental line. Mesal incision v-shaped, subacute at bottom but with the converging sides a little concave. Line of bases of teeth distinctly recurved; but the inner tooth on each side larger than the outer so that the line of apices is nearly straight. Teeth acute, the interval between those of each pair angularly rounded at bottom. Ectal spine stouter at base than the bristles, rapidly acuminate, short.

Coxal pores moderately small; in type, 2, 3, 3, 2.

The single article of the gonopod of male broad but short and only slightly exposed. Broadly truncate. A moderately long median apical bristle and at least one more ectal in position.

Spines of first to eighth pairs of legs,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 2}$ ; of ninth and tenth pairs,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of the eleventh,  $\frac{0, 0, 2, 1, 2}{0, 0, 1, 3, 2}$ ; of the twelfth,  $\frac{1, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 0, 3, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ , claw one. None of the coxae laterally armed.

Length cir. 7.5 mm. Length of antennae 2.7 mm.; of anal legs, 3+ mm.

LOCALITY.—Pennsylvania (Philadelphia!).

One male thus far known. Like the preceding species, the type of this one was found under the bark of a fallen log.

This species appears to be related somewhat closely to the two preceding ones; but it is very readily distinguishable through lacking a lateral spine on the anal coxae; the ventral spines of the anal leg being 0, 1, 3, 2, 0 instead of the more usual 0, 1, 3, 1, 0; the absence of spine from trochanter of thirteenth legs; the dorsal spines of the eleventh legs being 0, 0, 2, 1, 2 instead of 0, 0, 2, 1, 1 or 1, 0, 2, 1, 1, and the ventral 0, 0, 1, 3, 2 instead of 0, 0, 2, 3, 2 or 0, 0, 3, 3, 2; the ventral spines of the first legs being 0, 0, 1, 3, 2 instead of 0, 0, 1, 2, 1 or 0, 0, 1, 3, 1; through the almost obsolete crest of tibia of anal legs; and finally through apparently greater robustness.

#### GARIBIUS PAGOKETES, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs 1, 0, 2, 0, 0. Dorsal spines of penult legs, 1, 0, 2, 1, 0. Ventral spines of thirteenth legs, 0, 1, 3, 2, 2. Dorsal spines of twelfth legs 0, 0, 2, 1, 1; ventral 0, 0, 2, 3, 2. Dorsal spines of eleventh legs 0, 0, 2, 1, 2; ventral, 0, 0, 2, 3, 2. Dorsal spines of first legs 0, 0, 2, 1, 1; ventral, 0, 0, 1, 2, 1. All legs with the



third joint armed both dorsally and ventrally. Last two pairs of coxae laterally armed.

Antennae of usual structure and relations.

Ocelli 10 in two or three series.

Prosternum 1.65— times wider than long.

Length (type) 8 mm.

Body eight times longer than width of tenth plate.

Head equal in length and breadth.

First dorsal plate 1.65 times wider than long.

Dorsum brown, darker caudad. Head light in front of suture.

Antennae rufous yellow distad.

DESCRIPTION.—Dorsum brown, the caudal plates becoming somewhat dilute chestnut. Head pale in front of the suture. Antennae brownish, distally lighter, yellow of somewhat rufous tinge. Legs brownish yellow, the anterior pairs lightest, caudal pair more yellow distally. Venter light brown, darker, more reddish, caudad. Prosternum testaceous.

Head subcordate; equal in length and breadth; of nearly uniform width between eyes and lateral breaks or a little widest at the latter; widely rounded from the breaks caudad about the corners.

Antennae short. Articles distad of the third short and very short, the distal ones proportionately somewhat longer than the more proximal.

Eyes in type consisting of ten ocelli arranged in two or three series:—thus, 1+5, 4 to 1+4, 3, 2. Single ocellus large.

Prosternum about 1.65— times wider than long. Distance between chitinous spots 3.75 times width at median incision, 4 times the dental lines.

First dorsal plate 1.65 times wider than long. Posterior angles of eleventh and thirteenth dorsal plates obliquely excised.

Coxal pores small, circular, decreasing proximad; in number, 3, 3, 3, 3.

Spines of first legs,  $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 1}$ ; of second to sixth,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 1}$ ; of seventh to ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 2}$ ; of tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of eleventh,  $\frac{0, 0, 2, 1, 2}{0, 0, 2, 3, 2}$ ; of the twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 2, 1}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , claws 3; of the last,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claw single.

Claw of female gonopods proportionately wide, triparite, the divisions not differing much in length, acute. Inner spine of each pair markedly shorter than the outer (*maturus*). Spines not acuminate

from base, but somewhat constricted near middle of length and of greatest width immediately below the flattened acuminate opical portion, which is short.

In the type (♀) the widths of head, and first, third, eighth, tenth, and twelfth dorsal plates are as 50:46:48:56:57:56.

Length of type 8 mm.; width of tenth plate 1 mm.; length of antennae 2.4 mm.; of anal legs about 3 mm.

TYPE LOCALITY.—Massachusetts (Blue Hills!).

The closest allies of this species would seem to be *G. monticolens*, *opicolens*, and *dendrophilus*, from which it is to be separated by the characters assigned in the key and the diagnosis. The male is not known.

GARIBIUS MISSISSIPPIENSIS, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs 1, 0, 2, 0, 0. Dorsal spines of penult legs 1, 0, 2, 1, 0. Ventral spines of thirteenth legs 1, 3, 3, 2. Dorsal spines of twelfth legs 1, 0, 2, 1, 1; ventral, 0, 0, 2, 3, 2. Dorsal spines of eleventh legs 1, 0, 2, 1, 2; ventral, 0, 0, 2, 3, 2. Dorsal spines of first legs, 0, 0, 1, 1, 1; ventral, 0, 0, 0, 2, 1. All legs with the third joint dorsally armed, and all excepting the first with this joint also ventrally armed. Last two pairs of coxae laterally armed.

Ocelli about 12, in three series.

Antennae as usual.

Prosternum  $1\frac{2}{3}$  times wider than long. Distance between chitinous spots 2.5 times width at median incision;  $4\frac{1}{3}$  times the dental line. Incision strictly v-shaped.

Body 7.5 times longer than width of tenth plate.

Length (type), 6.75 mm.

Head cordate; clearly wider than long.

First dorsal plate 1.8+ times wider than long.

Fifth article of anal leg of male raised into an edge along dorso-mesal side with the ridge at caudal end elevated into a crest bearing a number of hairs of the usual character. Penult legs without lobes.

Pale testaceous with the posterior plates orange. Head orange or light ferruginous.

DESCRIPTION.—Dorsum pale testaceous with the posterior plates orange. Head orange or light ferruginous. Antennae yellow. Prosternum orange of paler shade than head. Venter pale with caudal plates more or less orange. Legs pale excepting the posterior pairs which are bright orange.

Body more robust relatively than in related species; 7.5 times longer than width of tenth dorsal plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 43:37:38:46:47:46.

Head cordate. Widest a little back of eyes from where the sides gently converge caudad; rather strongly narrowed cephalad. Wider than long in about ratio 43:40. Hairs rather short, sparse.

Antennae short, reaching the sixth segment or nearly so. Composed of the usual twenty articles which decrease in size distad from the second, and, excepting those at the two ends, are very short. Hairs short and not very dense.

Eyes composed mostly of about 12 ocelli which are arranged in three series:—thus, 1+5, 4, 2; 1+4, 4, 3. Single ocellus small, not larger than others. Seriate ocelli not contiguous, the caudal ones not larger than the anterior; all small.

Prosternum  $1\frac{2}{3}$  times wider than long. Distance between chitinous spots 2.5 times width at level of bottom of median incision;  $4\frac{1}{3}$  times the dental line. Median incision strictly v-shaped, being angular at bottom with sides straight or but very slightly concave. Teeth small and acute; the inner slightly larger than the outer; line of apices weakly recurved or straight. Spine inserted a little ectad of outer tooth as usual; slender, straight.

First dorsal plate widest at or near anterior end, the sides at first gently and then more strongly converging caudad; 1.8+ times wider than long. Caudal corners of ninth, eleventh, and thirteenth dorsal plates straight or a little rounded, none of these either at all produced or excised.

Coxal pores very small: 2, 3, 3, 2-3, 3, 3, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 2, 1}$ ; of the second to seventh inclusive,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 2, 1}$ ; of the eighth,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 3, 2}$ ; of the ninth,  $\frac{0, 0, 2, 2, 1}{0, 0, 2, 3, 2}$ ; of the tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 2, 3, 2}$ ; of the eleventh,  $\frac{1, 0, 2, 1, 2}{0, 0, 2, 3, 2}$ ; of the twelfth,  $\frac{1, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , with three claws; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claw single. Last two pairs of coxae laterally armed.

Anal legs of male short and moderately inflated; fifth article narrowed to an edge along dorso-mesal line with at caudal end of this ridge a low, dorsally gently convex, crest bearing a number of hairs of the usual character; longitudinally sulcate laterally. Penult legs less inflated; without lobes.

Length of type 6.75 mm.; width of tenth plate, .9 mm.; length of antenna, 2.25 mm.; of anal leg, 2.5 mm.

LOCALITY.—Mississippi (Brookhaven!).

GARIBIUS GEORGIAE, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs, 1, 0, 2, 0, 0. Dorsal spines of penult legs, 1, 0, 2, 1, 0. Ventral spines of thirteenth legs, 0, 0, 2, 3, 2. Dorsal spines of twelfth legs, 0, 0, 2, 1, 1 – 1, 0, 2, 1, 1; ventral, 0, 0, 2, 3, 2. Dorsal spines of eleventh legs, 0, 0, 2, 1, 1; ventral, 0, 0, 2, 2, 2. Dorsal spines of first legs, 0, 0, 1, 1, 1; ventral, 0, 0, 0, 2, 1. Third joint of all legs dorsally armed; but about first eight or nine pairs with this joint unarmed ventrally. None of the coxae laterally armed.

Antennae as usual.

Ocelli about 9 to 11 in three series.

Prosternum 1.9 times wider than long. Distance between chitinous spots 2.44 times width at median incision; 3.44 times the dental line.

Coxal pores 2, 3, 3, 2 – 2, 3, 3, 3.

Claw of gonopods of the female small; tripartite; lobes acute with the median considerably longest. Outer spine longer than the inner; moderately long and slender, attenuated from the base distad, the sides more strongly rounding in toward the apex.

Anal leg of male modified as usual, the fifth article bearing above a low ridge elevated into a low crest at caudal end.

Length 5.5 to 7.5 mm.

Body 9 times as long as width of tenth plate.

Head equal in length and breadth.

First dorsal plate 1.84 times wider than long.

Dorsum yellow, with caudal plates verging to light orange. Head light orange.

DESCRIPTION.—Yellow above, with the caudal plates tending toward light orange. Head light orange. Antennae yellow. Prosternum paler than head, being more of a lemon yellow. Venter very pale excepting the caudal plates which are like the prosternum. Legs pale, almost whitish, excepting the caudal pairs which are orange brown.

Rather slender, being nine times as long as the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 40:35:36:42:43:40.

Head equal in length and breadth or in the male it may be a little longer. Widest a little caudad of eyes from where the sides moderately converge caudad; rather strongly narrowed cephalad. Hairs short and sparse.

Antennae short; moderately attenuated; composed of twenty articles, most of which are short and very short, the ultimate relatively long. Hairs of moderate length, not very dense.

Eyes each composed of from 9 to 11 ocelli arranged in three series:—thus, 1+4, 4, 2; 1+4, 3, 3; 1+4, 3, 1; 1+4, 3, 2. Single ocellus of same size as or a little smaller than those of the upper series, the seriate ocelli decreasing in size cephalad and ventrad. All ocelli pale.

Prosternum 1.9+ times wider than long. Distance between chitinous spots 2.44 times the width at level of bottom of median incision; 3.44+ times the length of the dental line. Median incision rather narrowly v-shaped, the sides straight. Teeth nearly equal or with inner on each side somewhat larger making the line of apices straight or nearly so; acute, with sides strictly straight and the interval between the two of each pair angular, not at all rounded. Spine fine, but slightly stouter than the hairs; straight; inserted a little ectad of base of outer tooth. Lateral edges of anterior portion gently convex cephalad and bending ectad caudally as usual.

First dorsal plate with sides almost parallel from caudal third cephalad; 1.84 times wider than long. Posterior corners of the ninth, eleventh, and thirteenth plates rounded or rather obliquely excised.

Coxal pores very small; 2, 3, 3, 2-2, 3, 3, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 2, 1}$ ; of the second and third,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$ ; of the fourth to sixth,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the seventh,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 2}$ ; of the eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 2}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 2}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 2}$ ; of the tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1(0), 2, 2}$ ; of the eleventh,  $\frac{0, 0, 2, 1, 1}{0, 0, 2, 2, 2}$ ; of the twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 2, 3, 2}$  or  $\frac{1, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the thirteenth,  $\frac{1, 0, 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 0}{0, 1, 3, 2, 1}$ , claws 3; of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , the claw single. None of the coxae laterally armed.

Anal legs of male short and moderately inflated; longitudinally sulcate laterally but not dorsally; fifth joint complanate above, extended in a low, rather sharply edged, longitudinal ridge along dorso-mesal side which ends at caudal end in the usual crest, this being low with its free edge a little convex and bearing a series of hairs which are

curved at distal ends. Penult legs without any special modifications; moderately and uniformly inflated.

Claw of female gonopods small; considerably curved; tripartite; lobes acute with the median considerably longest. Outer of basal spines larger than the inner; moderately long and slender, a little attenuated from base distad, the sides toward end more strongly rounding in to the apex. Inner side of first article straight, a little diverging from its mate at anterior end.

Length of types from 5.5 to 7.5 mm. A specimen 7.3 mm. long has tenth plate .82 mm. wide, antennae 2.4 mm. long, and anal leg about 2.2 mm. long.

LOCALITY.—Georgia (Atlanta!).

GARIBIUS ALABAMAE, sp. nov.

DIAGNOSIS.—Dorsal spines of anal legs, 1, 0, 2, 0, 0. Dorsal spines of penult legs 1, 0, 2, 1, 1. Ventral spines of thirteenth legs, 0, 0, 2, 3, 2. Dorsal spines of twelfth legs, 0, 0, 2, 2, 2; ventral, 0, 0, 1, 2, 1. Dorsal spines of eleventh legs, 0, 0, 0, 2, 2; ventral, 0, 0, 0, 2, 1. Dorsal spines of first legs 0, 0, 0, 1, 1; ventral, 0, 0, 0, 1, 1. Third joint of first eleven pairs of legs or thereabouts unarmed either dorsally or ventrally. Last pair of coxae laterally armed.

Antennae as usual.

Ocelli about 6 in two series.

Prosternum 1.53 times wider than long. Distance between chitinous spots 2.4+ times width at median incision; 3.42 times dental line.

Crest of anal legs of male broader and more rounded than in related species; bearing numerous hairs of the usual type.

Length of type 5 mm.

Body 7.6+ times longer than the width of the tenth plate.

Head considerably longer than wide.

Dorsum anteriorly greyish yellow, becoming clearer yellow and light orange caudad. Head light orange.

DESCRIPTION.—Above the body is greyish yellow, becoming clearer yellow and light orange caudad. Head light orange. Antennae yellowish. Prosternum pale orange or yellow. Venter dilute yellow, deeper yellow caudad. Legs very pale excepting the caudal ones which are bright yellow.

Length about 7.6+ times the width of tenth dorsal plate. Widths of head and of first, third, eighth, tenth, and twelfth dorsal plates to



each other as 31:31+:31:34:34:33, the body being thus not strongly attenuated.

Head elongate, being considerably longer than wide (34:31). Hairs of moderate length, sparse.

Antennae short; moderately attenuated. Articles mostly very short, decreasing distad as usual; the ultimate moderately long. Hairs as usual in the genus.

Eyes composed of about 6 ocelli in two series:—thus, 1+3, 2. Single ocellus about equal in size to, or a little smaller than, the first one of the upper series. Seriate ocelli decreasing cephalad and ventrad; all pale.

Prosternum 1.53 times wider than long. Distance between chitinous spots 2.4+ times width at level of bottom of mesal incision; 3.42 times as great as the dental line. Teeth small and acute; interval between each pair rounded at bottom; inner tooth somewhat larger than the outer and the line of apices straight. Mesal incision rather wide and shallow, sides concave but meeting at an acute angle at bottom.

First dorsal plate widest a little back of the anterior end, the sides from there caudad at first slightly and then rather strongly converging. Posterior corners of ninth, eleventh, and thirteenth dorsal plates all straight on caudal side or a little rounded.

Spines of first legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1(0), 1}$ ; of the second,  $\frac{0, 0, 0, 1(2), 2}{0, 0, 0, 2(1), 1}$ ; of the third to eleventh inclusive,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the thirteenth,  $\frac{1, (0), 2, 1, 1}{0, 0, 2, 3, 2}$ ; of the penult,  $\frac{1, 0, 2, 1, 1}{0, 1, 3, 2, 1}$ , claws 2 (3); of the anal,  $\frac{1, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claw single. Last pair of coxae laterally armed.

Gonopods of male well exposed, convexly rounded, wart-like; bearing a single moderately long bristle.

Anal legs of male short, considerably inflated; fifth joint bearing at its distal end a low eminence which is relatively broader and more rounded than in related species, this lobe bearing over its surface rather numerous hairs of the usual character. Penult legs also inflated, but without any special lobes.

Length of type 5 mm.; width of tenth plate .65 mm.; length of antenna 1.6 mm.; anal leg of same length as antenna or nearly so.

LOCALITY.—Alabama (Morgan!).

A single male was secured.



## GARIBIUS BRANNERI (Bollman).

*Lithobius branneri* Bollman, Ann. N. Y. acad. sci., 1888, 4, p. 107.

DESCRIPTION.— The original description, rearranged, is as follows:—  
Light chestnut-brown or orange; head and antennae scarcely darker; feet orange.

Slender, smooth, very sparsely pilose.

Head rounded triangular, narrowest before.

Antennae short; joints 20, short.

Ocelli 6-8, arranged in four or five rows.

Prosternal teeth 4, small.

[Posterior angles of none of the dorsal plates produced].

Coxal pores 2, 3, 3, 2-3, 4, 4, 3, small and round.

First pair of feet armed with 0, 2, 1 spines; penultimate with 1, 3, 1, 1-1, 3, 2, 1; last with 1, 3, 1, 0.

In the male the fifth joint of the anal leg is produced into a short pilose lobe, and is depressed.

Claw of the female genitalia short, wide, bi- or tri-partite; spines slender, subequal, outer strongly toothed.

Length of body 5-10 mm.

TYPE LOCALITY.— Tennessee (Knoxville!).

LOCALITIES.— Tennessee (Knoxville! Beaver Creek; Mossy Creek).

## TIDABIUS, gen. nov.

Antennae short; composed of from 25 to 35 articles, but of mostly near 32.

Eyes composed mostly of from 9 to 14 ocelli which are arranged usually in three series; single ocellus largest.

Prosternum from 1.55 to 1.65 times wider than long, never less. Teeth 2+2; line of apices somewhat recurved. Spine bristle-like. Median incision v-shaped, being acute at bottom, or very rarely more or less rounded.

Body always considerably attenuated from the tenth plate cephalad with the first plate always and mostly considerably narrower than the third.

Posterior angles of none of the dorsal plates produced; or, often, with thirteenth or with eleventh and thirteenth showing a very weak production of these angles.

Coxal pores small and circular, uniseriate.

Gonopods of female tripartite with lobes short, the lateral ones equal and with their apices usually in nearly same transverse line. Basal spines 2+2 or, rarely, 3+3; proximal portion of spine relatively broad with sides parallel or diverging to where the acutely acuminate terminal portion begins more or less abruptly (Plate 4, fig. 5).

Posterior coxae always wholly unarmed. Anal legs with the dorsal spines uniformly 0, 0, 2, 0, 0; ventral spines, 0, 1, 3, 1, 0 or, in some, 0, 1, 3, 2, 0; claws always 2 or 3. Penult legs with dorsal spines 0, 0, 3, 1, 0, or, rarely, 0, 0, 3, 1, 1; ventral spines, 0, 1, 3, 3, 1, to 0, 1, 2, 3, 1; claws 2 or 3. Third joint of first 7 to 9 pairs of legs mostly unarmed, rarely armed. Tibia of none of the legs with more than one ventral spine. All tarsi biarticulate.

Posterior legs in both sexes short and moderately inflated, longitudinally more or less sulcate dorsally; in male presenting no special modifications, or with legs but little more crassate.

Length between 5.5 and 10 mm.

TYPE.—*T. tivius* Chamberlin.

DISTRIBUTION.—The known species are distributed across the continent through the Northern United States from Washington and Oregon to the Atlantic and from there into the Southeastern States.

These small and wide-spread lithobiids never exceed 10 mm. in length. In most of the species the head varies from yellowish to ferruginous and is distinctly lighter than the dorsum. The venter commonly is suffused anteriorly with violaceous. The posterior legs are typically more brightly colored distad. These forms occur commonly under leaves and sticks of willows and other trees and shrubs along streams, under bark of logs, among stones at the water's edge and in other similar places. Where found they usually occur in considerable numbers. The species to one examining them at first commonly seem very close in general structure and appearance and are to be discriminated only upon careful study and comparison. The following key will aid in separating average individuals.

*Key to species of Tidabius.*

- a. Ventral spines of anal legs 0, 1, 3, 2, 0 or 0, 1, 3, 3, 0.
- b. Third article of all legs, or of all excepting the first two pairs, ventrally armed. *T. poaphilus*, sp. nov.
- bb. Third article of at least the first five pairs of legs unarmed ventrally.

- c. Dorsal spines of penult legs 0, 0, 3, 1, 1.  
*T. anderis*, sp. nov.
- cc. Dorsal spines of penult legs 0, 0, 3, 1, 0.
  - d. Anal leg with 3 distinct claws; basal spines of ♀ gonopods 3+3.  
*T. bonrillensis* Chamberlin.
  - dd. Anal leg with but 2 distinct claws; basal spines of ♀ gonopods 2+2.
    - e. Body 8 times, or but little more, as long as width of tenth plate.  
*T. suitus*, Chamberlin.
    - ee. Body 9 or more times as long as width of tenth plate.  
*T. nasintus*, sp. nov.
- aa. Ventral spines of anal legs 0, 1, 3, 1, 0.
  - b. Length of body of adults less than 8 mm.; mostly from 7.25 to 8.25 times longer than width of tenth plate.  
*T. tivius* Chamberlin.
  - bb. Length of body of adults 8 mm. or more; 8.5 or more times longer than width of tenth plate.
    - c. Ventral spines of eleventh legs 0, 0, 1, 3, 1; of the thirteenth, 0, 1, 2, 3, 1 or 0, 0, 2, 3, 1.  
Body 9 to 9.5 times longer than width 10th plate.  
*T. opiphilus*, sp. nov.
    - cc. Ventral spines of eleventh legs 0, 0, 2, 3, 1; of the thirteenth, 0, 1, 3, 3, 1.
      - d. Dorsum brown; head brown of ferruginous caste; body about 8.5 times longer than width of 10th plate.  
*T. pallidus alabamensis*, subsp. nov.
      - dd. Dorsum yellow; head light orange; body about 9 times longer than width of 10th plate. *T. pallidus*, sp. nov.

TIDABIUS NASINTUS, sp. nov.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 2, 0. Dorsal spines of penult legs, 0, 0, 3, 1, 0. Third joint of eleventh to fourteenth legs with three dorsal spines. Ventral spines of tenth and eleventh legs 0, 0, 1, 2, 1. Ventral spines of first legs, 0, 0, 0, 1, 1.

Articles of antennae (in type) 30.

Ocelli 11 in three series.

Distance between chitinous spots of prosternum 2.58 times width at median incision; 3.75–4 times the dental line.

Head slightly wider than long.

Coxal pores 2, 3, 3, 3.

Slender, about 9.3 times longer than the width of tenth plate.

First dorsal plate only  $1\frac{2}{3}$  times wider than long.

Outer of basal spines on each side longer than the inner with which it stands at an angle; spines broad at base with sides slightly diverging to middle where acuminate portion begins.

Dorsum light brown, the caudal plates darker. Head darker brown or dilute chestnut with frontal region paler.

DESCRIPTION.—Above light brown with the caudal plates darker. Head darker brown or dilute chestnut, the frontal region paler. Antennae brown proximally, light at tips. Prosternum brown; prehensorial feet yellowish. Venter pale with the caudal plates darker, brownish. Legs like the corresponding plates of venter, the posterior pairs there being darker, brownish, but brighter distad as usual.

Body slender, being in the type 9.3 times longer than the width of the tenth plate. The widths of head and of the first, third, eighth, tenth, and twelfth plates to each other approximately as 41:35:38:43:45:43.

Head subcordate. Slightly wider than long (ratio about 41:40). Not much varying in width between caudal edge of eyes and the marginal breaks.

Antennae short. Composed of thirty articles which distad of the second or third become very short and closely arranged. Hairs short extending in part distoectad and in part proximoectad as usual.

Eye, in the type, composed of eleven ocelli arranged in three series:—thus, 1+4, 3, 3. Single ocellus largest. Ocelli of upper series larger and paler than others which decrease in size ventrad.

Prosternum, in type, 1.58— times wider than long. Distance between chitinous spots 2.58 times width at level of bottom of median incision; 3.87 times the dental line. Median incision rather small, v-shaped. Teeth small, acute, with sides nearly straight; inner tooth a little larger than the outer but the line of apices clearly re-curved. Distance from tip to tip of mesal teeth about equal to or a little less than that from tip to tip of the two of each lateral pairs. Lateral margin of anterior portion convex anteriorly and concave posteriorly, where it bends ectad at end as usual.

First dorsal plate  $1\frac{2}{3}$  times wider than long; widest a little back of the anterior end where the sides are convex, the sides then moderately converging caudad to the rounded corners. Caudal margin of the ninth plate straight or nearly so; angles of eleventh and thirteenth very slightly produced, the process rounded; posterior corners of other minor plates more or less obliquely excised.

Coxal pores circular; small, decreasing in size proximad on each coxa; 2, 3, 3, 3.

Spines of first legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the second,  $\frac{0, 0, 1, 1(2), 1}{0, 0, 0, 2, 1}$ ; of the third and fourth,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$ ; of the fifth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the seventh and eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 2, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 2, 3, 1}$ ; of the fourteenth,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ , with two claws. None of the coxae at all armed.

Anal and penult legs of the female short, weakly inflated; especially the fourth joint longitudinally sulcate above.

Claw of female gonopods short and relatively wide; tripartite; the lobes short but distinct, the median longer than the lateral which are equal in size and at the same level. Outer of the two basal spines of each pair with which its wider surface stands at an angle as usual; spines broad at base with sides slightly diverging to the middle and then converging to a very acute apex, the sides of the acuminate portion being somewhat incurved. Inner side of first article of gonopods slightly curving ectad at proximal end and then a little diverging from its fellow.

Length of type 8 mm.; width of tenth plate, .86 mm.; length of antennae, 2.3 mm.; of anal leg, 2.1 mm.

LOCALITY.—Mississippi (Jackson!).

#### TIDABIUS SUITUS (Chamberlin).

*Lithobius cantabrigensis* var. *suitus* Chamberlin, Ann. Ent. soc. America, 1911, 4, p. 41.

DIAGNOSIS.—Ventral spines of anal legs, 0, 1, 3, 2, 0. Dorsal spines of penult legs 0, 0, 3, 1, 0 or 0, 0, 2, 1, 0. Third joint of tenth to fourteenth legs inclusive armed with three dorsal spines. Ventral spines of tenth and eleventh legs, 0, 0, 1, 2, 1. Ventral spines of first legs, 0, 0, 0, 1, 1 or 0, 0, 0, 2, 1. None of the coxae armed.

Articles of antennae 29–32.

Ocelli 8–11 in 2 or 3 series.

Distance between chitinous spots of prosternum 2–2.25 times width at median incision; 3.75–4 times as great as the dental line. Median incision rather large, widely rounded at bottom.

Coxal pores 2, 3, 3, 2-3, 4, 4, 3.

Head subcordate, wider than long.

Body moderate; about eight times longer than the width of the tenth plate.

Median lobe of claw of female gonopods but little longer than the lateral. Basal spines very broad proximally, sides parallel or slightly diverging to about the middle where the acuminate portion begins.

Dorsum brown, with posterior segments darker and more reddish as are also sometimes the first ones. Head brown of dilute ferruginous tinge, especially anteriorly.

DESCRIPTION.—Brown above, with the posterior segments considerably darker and more reddish; some of the anterior plates may also be darker, especially along the caudal borders, these also often showing a violaceous tinge. Head brown of dilute ferruginous tinge, especially anteriorly. Antennae brown of purplish tinge, distally lighter, yellow or yellowish of dilute ferruginous tinge. Prosternum brown, the prehensorial feet lighter. Venter very pale, the anterior plates showing a distinct violaceous or purplish tinge and the caudal plate much deeper in color and more or less of reddish tinge. Legs like the corresponding plates of venter; the posterior pairs darker brown with the distal joints light.

Body moderate, being on an average 8+ times longer than wide. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 25.5:22:22:26:27:26.

Head subcordate; wider than long in about ratio 25.5:24. Hairs short, sparse. Form and markings as usual.

Antennae short, reaching the fifth segment composed of from 29 to 32, mostly very short, articles. Hairs moderate, straight, in part extending distoectad and in part almost directly transversely or somewhat caudoectad.

Eyes each composed mostly of about 8 or 9 to 11 ocelli in two or three series:—thus, 1+4, 4; 1+3, 3, 1; 1+4, 4, 2. Single ocellus considerably the largest. Seriate ocelli decreasing in size cephalad and ventrad.

Prosternum 1.58 times wider than long. Distance between chitinous spots 2 to 2.25 times greater than width at level of bottom of mesal incision; 3.75 to 4 times as great as the dental line. Teeth small; subacute; the interval between each pair concave; line of apices clearly recurved. Mesal incision rather large, sides but little converging caudad, the bottom being rather widely rounded. Spine slender and acuminate; inserted a little ectad of outer tooth and



extending somewhat mesad of directly cephalad. Lateral margin ectad of spine, convex, more caudad becoming concave and bending ectad.

Coxal pores small and circular; 2, 3, 3, 2 to 3, 4, 4, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$  or  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 2, 1}$ ; of the second to fifth inclusive,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the sixth and seventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the eighth and ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$  or  $\frac{0, 0, 2, 1, 0}{0, 1, 3, 3, 1}$ , claws 2 (or with obsolete third one); of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ , claws 2 (in regenerated legs may be but 1). None of the coxae at all armed.

Anal legs of male short and a little inflated; the third, fourth and fifth, but most distinctly the fourth, joints longitudinally sulcate on dorsal side. Penult legs similar but a little more slender.

Claw of the female gonopods short and relatively wide; tripartite; the median lobe but little longer than the two lateral, the distal margin of the latter almost at right angles to the longitudinal axis of claw. Basal spines very broad at base as usual, the sides parallel or a little diverging to about middle of length, then converging to an acute point. Inner side of first article nearly straight, being a little convex distally and slightly concave proximally, nearly parallel to that of its opposite gonopod.

Length 7-9 mm. A female 8 mm. long has the tenth plate .98 mm. wide; antenna 4 mm. long; and the anal leg 3.8-4 mm. long.

*Præmaturus*.—Coloration similar to that of adult but paler throughout; light brown of a pale violaceous caste, with the fourteenth plate darker and the fifteenth lighter, the latter being yellowish as in the adult. Head light orange. Antennae brown, light at tips. Prosternum yellowish. Venter pale, the first plates more strongly tinged with violaceous, and the last one more strongly pigmented, yellowish or light orange. Legs pale, suffused with very dilute violaceous, the last pairs light yellow excepting proximally.

Antennae composed of twenty-five articles of which those beyond the third or fourth are very short and compactly arranged and those near the middle of length the shortest. Hairs straight, of moderate length, not dense.

Eyes composed of seven or eight ocelli arranged in two series:—thus, 1+4, 3; 1+4, 2. Ocelli small and pale, the single one largest and the most anterior ones smallest.

Prosternum is in adult or nearly so.

Coxal pores very small; 2, 3, 3, 3.

Spines of first legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the second,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$  to  $\frac{0, 0, 0, 2, 1}{0, 0, 0, 1, 1}$ ; of the third to sixth,  $\frac{0, 0, 0, 2, 1}{0, 0, 0, 2, 1}$ ; of the seventh,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$ ; of the eighth,  $\frac{0, 0, 1, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 2, 1, 1}{0, 0, 0, 1, 2, 1}$  or  $\frac{0, 0, 2, 1, 1}{0, 0, 1, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 2, 1, 1}{0, 1, 2, 3, 1}$ ; of the penult,  $\frac{0, 0, 2, 1, 0}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ .

Claw of female gonopods short and relatively wide, with the three divisions acute and the outermost somewhat smallest. Spines 2+2; the outer one of each pair of nearly adult form, being broad or somewhat clavate proximally and acuminate from near the middle of length, the apex very narrowly rounded, the inner spine about half the size of the outer one, acuminate from very base.

Length cir. 5.25 mm. Length of antennae 2 mm.; of anal legs, cir. 2.2 mm.

(Haddonfield, N. J., Oct. 27, 1912).

*Immaturus*.—Still paler than the *prematurus*; of a violaceous tinge throughout; the last dorsal slate yellow. Head and prosternum yellow. Anal and penult legs with tibiae and tarsi yellow, the more proximal joints having the pale violaceous tinge of the rest of the legs.

Antennae very short. Composed of nineteen articles which distad of the third are very short. Hairs about as in the *prematurus*.

Eyes composed of about six ocelli arranged in two series:—thus, 1+3, 2. The most caudal ocellus of the dorsal series largest, the single one next, with the anterior one and those of the lower series much smaller.

Prosternum essentially as in older stages.

Coxal pores very small and pale; 2, 2, 2, 2.

Spines of first to third pairs of legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the fourth to sixth pairs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the seventh to ninth pairs,  $\frac{0, 0, 0, 2, 1}{0, 0, 0, 1, 1}$ ; of the tenth and eleventh pairs,  $\frac{0, 0, 0, 2, 2}{0, 0, 0, 1, 1}$ ; of the twelfth,  $\frac{0, 0, 1, 1, 1}{0, 0, 1, 2, 1}$ ; of the thirteenth,  $\frac{0, 0, 2, 1, 1}{0, 0, 1, 2, 1}$  or  $\frac{0, 0, 2, 1, 1}{0, 1, 1, 2, 1}$ ; of the penult,  $\frac{0, 0, 2, 1, 0}{0, 1, 2, 2, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ .

Gonopods of female very short and pale; the three articles present, but the division between the second and third not yet very distinct. Claw indicated as a mere spinous point, the article beneath it distally

well rounded and bearing also a single bristle. Second article likewise bearing a single bristle. Proximal article bearing three bristles in a transverse row. Spines 1+1, small and pale; acutely acuminate from the very base.

Length cir. 4.2 mm.

(Haddonfield, N. J., Oct. 27, 1912).

TYPE LOCALITY.—North Carolina (Hot Springs!).

LOCALITIES.—North Carolina (Hot Springs!); Alabama (Birmingham!); New Jersey (Haddonfield!).

### TIDABIUS POAPHILUS, sp. nov.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 2, 0. Dorsal spines of penult legs, 0, 0, 3, 1, 0. Third joint of tenth to fourteenth legs bearing 3 dorsal spines. Ventral spines of tenth and eleventh legs, 0, 0, 2, 3, 1. Ventral spines of the first legs, 0, 0, 1, 1, 1, or, occasionally, 0, 0, 0, 1, 1. None of the coxae armed.

Articles of antennae 32.

Ocelli 9–12 in three series.

Distance between chitinous spots about 2.25 times the width at median incision; 4 times the dental line.

Coxal pores 3, 4, 4, 3.

Head wider than long.

Body moderately robust, 7.5–7.75 times longer than the width of the tenth plate.

Claw of female gonopods as typical in the genus. Spines broad proximally, the sides of this portion parallel or a little diverging; acuminate portion more than half the total length.

Dorsum brown or greyish brown, suffused with dark purplish; the first and last several plates darker. Head brown to orange-brown, with the frontal region lightest.

DESCRIPTION.—Above brown or greyish brown, commonly suffused with dark purple; the first and the last several plates darkest. Head brown or orange-brown, the frontal region lightest. Antennae light brown, lighter at tips, often tinged with purplish. Prosternum and prehensors brown. Venter greyish or dilute greyish brown, the anterior plates typically tinged with purple and the caudal plates darker, brown. Legs like the corresponding plates of venter, the first commonly with a purplish tinge and the caudal pairs brownish proximally, brighter, yellowish, distally.

Body moderate or rather robust; the type 7.65 times longer than the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 23:21:23:26:27:26.

Head wider than long in ratio 50:47.5. Caudal margin slightly and widely excurved. Sides between eyes and marginal interruptions very little excurved, subparallel. Hairs long, sparse.

Antennae of the usual length. Composed of 32 articles which beyond the second are very short and closely united, submoniliform. Hairs of moderate length and short; not very dense, sparser proximad; extending in various directions as usual.

Eyes each composed of 9-11 ocelli arranged in three, or occasionally, in but two, series:—*e. g.*, 1+4, 3, 3; 1+1, 4, 3; 1+5, 3. The lowest series almost on ventral side of head. Single ocellus largest. Of the seriate ocelli the first or most caudal of the uppermost series is largest, the first of the second series also large; others decreasing cephalad and ventrad as usual.

Prosternum 1.64 times wider than long. Distance between chitinous spots 2.25 times width at level of bottom of median incision; 4 times as great as the length of the dental line. Median incision moderately large, sides gently converging caudad; rather widely rounded at bottom. Teeth small, acute, equal; line of apices recurved. Tubercle of spine contiguous with base of outer tooth as usual; spine rather stout at base, running to a fine point with sides straight throughout length or nearly so, extending directly cephalad or nearly so, as in *T. anderis*. Lateral margins of anterior portions sloping directly caudoectad immediately from base of spine; the margins strongly incurved with caudal portion almost transverse. (Plate 5, fig. 3).

First dorsal plate with sides diverging cephalad to about the middle and then parallel or nearly so. 1.8+ times wider than long. Caudal angles of thirteenth plate a little produced as usual; angles of eleventh rectangular or showing a slight tendency to production; other minor plates with caudal margins bending a little forward at ends about the rounded corners. All plates finely but distinctly roughened with tubercular and rugose elevations.

Coxal pores small, circular; 3, 4, 4, 3; on each coxa decreasing in size proximad with the most proximal often very small.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 1, 1, 1}$  or  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ , of the second,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 2, 1}$  or  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the third to fifth inclusive,  $\frac{0, 0, 2, 2, 1}{0, 0, 1, 2, 1}$ ; of the sixth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the seventh and eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ , or on

one side this and on the other,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$ , or  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ , claws 3; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ , claws 2. None of the coxae at all armed.

Posterior legs but little, uniformly inflated. Third, fourth, and fifth articles longitudinally furrowed on dorsal side as usual. Not differing in male and female.

Gonopods of the male small and rounded; bearing 1 or 2 bristles.

Claw of female gonopods short and but slightly curved; distinctly tripartite in the usual way; median lobe longest, obtusely rounded, less acuminate than in *anderis*; lateral lobes with distal margins nearly at right angles to axis of claw. Basal spines broad at base as in related species; the sides proximally parallel or a little diverging distad; acuminate portion long, more than half the total length. Mesal margin of first joint nearly straight, a little diverging from its fellow cephalad. Sternite mesally a little incurved as in related species and without a distinctly chitinized process.

The ♂ type is 7.5 mm. long; width of tenth dorsal plate .98 mm.; length of antenna 2.5 mm.; of anal leg, 3 mm.

TYPE LOCALITY.—Nebraska (Fremont).

LOCALITIES.—Nebraska (Fremont! Omaha!).

#### TIDABIUS ANDERIS, sp. nov.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 2, 0. Dorsal spines of penult legs, 0, 0, 3, 1, 1. Third joint of twelfth to fourteenth pairs of legs inclusive with three dorsal spines. Ventral spines of tenth and eleventh legs, 0, 0, 1, 2, 1. Ventral spines of first legs 0, 0, 0, 1, 1. None of the coxae armed.

Articles of antennae (in type) 31.

Ocelli 8 in two series.

Distance between chitinous spots 4 times the dental line; 2.46 times width at median incision.

Coxal pores 3, 4, 4, 3.

Claw of female gonopods as typical in the genus. Spines broad at base as in *T. tivius* but the acuminate apical portion embracing considerably more than half the total length.

Head longer than wide.

Body robust, being only about 7.4 times longer than width of tenth plate.

Dorsum testaceous, usually of dilute olivaceous or, sometimes, of somewhat purplish tinge; first and last plates darker as usual. Head yellowish orange to light ferruginous.

DESCRIPTION.—Above testaceous, in some of dilute olivaceous tinge, in others more or less purplish; the first plate and the most caudal ones often darker and some of the plates with their caudal borders crossed by a transverse dark stripe. Head yellowish orange to light ferruginous with a dark area on caudal portion along margin and extending forward along median line part way to the suture. Antennae brownish proximally, becoming yellow distad. Prosternum and prehensorial feet yellow to brown, the prosternum usually dusky over a yellow background. Venter pale, dilute testaceous or yellowish, the caudal plates darker brown. Legs like the contiguous plates of venter excepting that the posterior pairs beyond the proximal portion are bright yellow.

Body robust; in ♀ type, 7.4 times longer than width of tenth plate. Widths of head and of the first, third, eighth, tenth, and twelfth plates to each other as 25:23:24:28:26.5.

Head longer than wide in ratio 50:47; a little more elongate than in *T. tivius* with the anterior portion somewhat narrower; not much varying in width between the marginal breaks and eyes; caudal margin straight.

Antennae short or very short. Composed of 31 articles which are very short, especially distad, and are closely aggregated. Bristles moderate in length, subdense on distal articles, becoming considerably sparser proximad.

Eyes in type each composed of about 8 ocelli arranged in two series:—thus, 1+4, 3. Ocelli large and distinct; single ocellus somewhat obliquely elliptic.

Prosternum 1.64 times wider than long. Distance between chitinous spots 2.46 times width at level of bottom of median incision; 4 times as great as length of the dental line. Teeth small and acute, pale; line of apices recurved. Tubercle of spine contiguous with base of outer tooth; spine manifestly stouter than the hairs, acutely acuminate as usual, extending almost directly cephalad and thus not parallel with outer edge of tooth as is more typically the case in *tivius*. Median incision rather narrow, the sides nearly parallel, but little converging caudad excepting toward bottom, the latter somewhat rounded.



First plate moderately narrowed caudad as usual, 1.9 times wider than long. Minor plates as in *tivius* or nearly so; in the anterior ones the caudal margin moderately bending forward to corners at ends; in the eleventh the posterior corners are nearly rectangular; in the thirteenth they are a little extended caudad. Plates all distinctly finely roughened.

Coxal pores small, circular, the most proximal one on some coxae minute; 3, 4, 4, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the second to sixth inclusive,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the seventh to ninth inclusive,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth and thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 2, 0}$ , claws 2. No spines detected on any coxae.

Anal and penult legs in both sexes short; a little thickened.

Claw of female gonopods short; but little curved; median lobe longest, distally more or less narrowly rounded; lateral teeth with their distal edges in line and at right angles to the axis of the claw or nearly so. Spines broad at base as in *tivius*, but the acuminate portion longer, embracing considerably more than half the total length, apically acutely rounded with edge often showing a few minute denticulations. Ventral edge of mesal side of first joint well chitinated; nearly straight excepting proximally where it bends a little ectad.

The female type is 7.4 mm. long; width of tenth plate 1 mm.; length of antenna 2.25 mm.

LOCALITY.—Washington (Pullman! W. M. Mann, 1908).

#### TIDABIUS PALLIDUS, sp. nov.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 1, 0. Dorsal spines of penult legs 0, 0, 3, 1, 0. Third joint of tenth to fourteenth legs with three dorsal spines. Ventral spines of tenth and eleventh legs, 0, 0, 2, 3, 1. Ventral spines of first legs, 0, 0, 0, 1, 1. None of the coxae armed.

Articles of antennae, in type, 27.

Ocelli 9 or 10 in three series.

Distance between chitinous spots of prosternum 3.5 times the dental line; only 2.1 times width at median incision.

Head cordate, very little wider than long.

Coxal pores 3, 4, 4, 3.

Body moderately slender, about nine times longer than the width of the tenth plate.

Spines of ♀ gonopods large and broad, the sides parallel to near middle from where the acutely acuminate portion begins.

Dorsum yellow. Head light orange.

DESCRIPTION.—Yellow above with the caudal plates light orange. Head light orange. Antennae pale. Prosternum yellow of pale orange tinge. Venter very pale with caudal plates orange. Legs pale, the posterior pairs more densely pigmented, brighter in color.

Body slender, being 9 times longer than the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 45: 40: 43: 51: 52: 48.

Head cordate; slightly wider than long (ratio about 45.5: 44). Hair short, sparse.

Antennae short and moderately attenuated as usual. In type composed of 27 articles which beyond the second are very short, shorter ones occurring in pairs at intervals among somewhat longer ones. Hairs as usual.

Eyes in type each composed of 9 or 10 ocelli arranged in three series:—thus, 1+4, 3, 1; 1+4, 3, 2. Single ocellus largest; first ocellus of top row also large and the others of this series also larger than the lower ones which decrease in size ventrad.

Prosternum 1.58 times wider than long. Distance between chitinous spots 2.1 times the width at level of bottom of median incision; 3.5 times the dental line. Median incision wide; sides distally concave, meeting at bottom in a wide angle; distance from tip to tip of mesal teeth clearly greater than between tips of teeth of each pair. Teeth small and acute; line of apices slightly recurved. Anterior lateral margin at first strictly transverse ectad of each outer tooth for a short distance, this portion bearing the spine, the caudally sloping portion at first conspicuously convex, becoming caudally concave and at caudal end bending directly ectad. Spine conspicuously stout at base, slender and fine pointed distally.

First dorsal plate 1.78 times wider than long, shaped as in *T. nasintus*. Caudal corners of thirteenth plate a little produced as usual; those of the eleventh caudally straight or somewhat excised; those of the ninth mostly a little excised or with caudal edge bent forward.

Coxal pores of the usual size and form; 3, 4, 4, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the second to seventh inclusive,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 3, 1}$ ; of the tenth and eleventh,

$\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ , claws 2; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claws 2. None of the coxae armed.

Posterior legs as usual.

Claw of female gonopods relatively short and wide as usual; lobes short but distinct, the median longest, the two lateral subequal and at same level with their caudal edges almost transverse. Spines large, broad, with sides from base to about middle parallel, spines distad from middle acutely acuminate. Inner side of first article diverging moderately from its fellow proximally.

The female type is 8.7 mm. long; width of tenth plate .97 mm.; length of antenna 3 mm.; of anal leg, 2.7 mm.

LOCALITY.—Mississippi (Jackson!).

*TIDABIUS PALLIDUS ALABAMENSIS*, subsp. nov.

DIAGNOSIS.—Light brown, with the first and last plates darker. Head brown of dilute ferruginous tinge.

Somewhat more robust than type of *T. pallidus*, being but 8.5 times longer than width of the tenth plate.

Spining of legs as in *pallidus* or essentially so.

Coxal pores 3, 4, 4, 4.

Head as in *pallidus*.

Gonopods and spines nearly as in *pallidus*.

Distance between chitinous spots 3.1 times the dental line.

DESCRIPTION.—Dorsum light brown, the first two or three plates and, more especially, those of the caudal third distinctly darker. Head brown of pale ferruginous tinge. Antennae brown proximally, pale distally. Prosternum and prehensorial feet brown. Venter pale, the anterior plates suffused with violaceous, the posterior plates darker, brownish. Legs like adjoining plates of venter; the posterior pairs brown proximally and bright yellow or yellow of dilute orange tinge distally.

Body 8.5 times longer than width of the tenth plate. Widths of head and of the first, third, eighth, tenth, and twelfth plates to each other as 42:40:42:47:50:48.

Head a little wider than long (near 42:41); widest immediately back of eyes, with the sides conspicuously converging from the breaks caudad.

Antennae in type broken off at tips so precise number of articles is not determinable.

Eyes each composed of 12 ocelli in three series:—thus, 1+4, 4, 3; ocelli of the usual relative sizes and arrangement.

Prosternum 1.55+ times wider than long. Distance between chitinous spots about 2 times width at level of bottom of median incision; 3.1 times the dental line. Median incision wide, well rounded at bottom; distance from tip to tip of mesal teeth clearly greater than distance between tips of tenth of each pair. Teeth small and acute; line of apices almost straight, being only very slightly recurved. Sides of anterior portion convex anteriorly and bending ectad caudally as usual. Spine of usual form.

First dorsal plate of the usual shape, slightly shorter relatively than in type of *pallidus*. Thirteenth plate with posterior angles weakly produced; other minor plates with caudal corners more or less obliquely excised.

Coxal pores of usual size and shape; 3, 4, 4, 4.

Spines of first legs,  $\frac{0, 0, 2, 1, 1}{0, 0, 0, 1, 1}$ ; of the second to fifth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the sixth to eighth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the tenth,  $\frac{0, 0, 3, 2, 2}{0, 0, 2, 2, 1}$  or  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$ ; of the eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 2, 3, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ , claws 2; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claws 2, long. None of the coxae armed.

Claw of female gonopods short and relatively wide; lobes short, with the median only a little longest, the two lateral equal and at the same level. Spines broad proximally, the sides diverging from base to a little below middle, the spine then acutely long acuminate. Inner side of first article subparallel with that of its mate excepting proximally, where it moderately diverges from it.

Length of female type 8 mm.; width of tenth plate .94—mm.

LOCALITY.—Alabama (Selma!).

While manifestly very close to *pallidus*, the type of *alabamensis* is strikingly different in color, being much more in appearance like *nasutus*. Otherwise it differs a little also in robustness, being a little stouter. The prosterna are very similar. As only the type of each form has been examined, the precise relationship of the two cannot at present be definitely determined; but it seems best to keep them apart tentatively and to range one as subspecies to the other.

## TIDABIUS TIVIUS (Chamberlin).

*Lithobius tivius* Chamberlin, Ann. Ent. soc. America, 1909, 2, p. 188.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 1, 0. Dorsal spines of penult legs, 0, 0, 3, 1, 0. Third joint of tenth to fourteenth legs armed dorsally with three spines. Ventral spines of eleventh legs, 0, 0, 2, 2, 1; ventral spines of first legs, 0, 0, 0, 0, 1. None of the coxae armed.

Articles of antennae 25 to 31.

Ocelli mostly 9 to 12 in three series.

Distance between chitinous spots 3.8 to 4.25 times the dental line; 2.3 times width at median incision.

Head equal in length and breadth or very nearly so.

Body robust, from 7.25 to 8.25, or thereabouts, times longer than the width of the tenth plate.

Coxal pores 2, 3, 4, 3-3, 4, 4, 3.

Claw of gonopods as usual. Spines broad with sides diverging to about the middle where the acuminate distal portion begins. (Plate 4, fig. 5).

Dorsum pale brown or of pearl-grey caste, with the caudal plates more or less of a ferruginous tinge. Head light ferruginous.

DESCRIPTION.—Above pale brown faintly suffused with violaceous or sometimes of pearl-grey caste; the caudal plates somewhat ferruginous. Head light ferruginous, commonly darkened over median region of caudal portion. Antennae brown to somewhat ferruginous proximally, lighter distad. Prosternum paler than head, the prehen-sorial feet lighter. Venter very pale, suffused with violaceous; the caudal plates darker, more or less of ferruginous tinge. Legs also pale, the caudal pairs darker, brown, proximally, and brighter, yellowish, distad.

Body robust, being about 7.25 to 8.25 times longer than the width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 40:34:37:40:43:42.

Head subcordate; equal in length and breadth or very nearly so. Hairs moderately long with shorter ones intermixed, sparse.

Antennae short and moderately attenuated. Composed of 25 to 31 articles which distad of the second are very short. Bristles almost transverse not especially dense. (Plate 5, fig. 6).

Eyes each consisting of 10 or 11 ocelli in the types:—*e. g.*, 1+4, 4, 2; 1+4, 3, 2. Single ocellus largest; others regular in form and arrangement. (Plate 5, fig 7).

Prosternum 1.58 times wider than long. Distance between chitinous spots 2.3 times width at level of bottom of median incision; 3.8 to 4.25 times the dental line. Median incision v-shaped, with sides rather strongly converging. Teeth small and acute; interval between the two on each side semicircular; line of apices clearly recurved. Anterior lateral margins rather strongly convex anteriorly, concave caudally. (Plate 5, fig. 2-3).

First dorsal plate 1.8 times wider than long; widest a little behind the anterior end where the sides are convex; sides then nearly straight and moderately converging to the rounded caudal corners. Posterior angles of the eleventh and thirteenth plates a little extended caudad, rounded, those of ninth straight or obliquely excised.

Coxal pores small and circular as usual; 2, 3, 4, 3-3, 4, 4, 3.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 0, 1}$  or  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the second,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 1, 1}$  or  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the third to fifth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ ; of the sixth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the seventh to ninth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the tenth,  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$ ; of the eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 2, 2, 1}$  or  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 1, 2, 3, 1}$  to  $\frac{0, 0, 3, 1, 1}{0, 1, 3, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claws 2. None of the coxae armed.

Anal and penult legs (♀) short; uniformly a little inflated. (Plate 5, fig. 4-5).

Claw of gonopods of female moderate; relatively wide; but weakly curved; the median lobe longest and the lateral ones equal and at the same level as usual. Basal spines broad proximally; sides diverging a little from base to about middle where the acutely acuminate distal portion begins, the sides of the latter straight. Mesal side of first article moderately diverging in proximal half from its fellow. (Plate 4, fig. 5).

Length 5.5-7 mm. A specimen 5.8 mm. in length has tenth plate .8+ mm. wide; and antenna 2 mm. long.

*Pseudomaturus*.—Freshly matured individuals seem to agree in nearly all features with the older ones; but the sixth legs more frequently bear but a single dorsal tibial spine instead of two and the eleventh legs more frequently bear a single ventral spine on the prefemur instead of two. Thus the spining, as might be expected, more frequently remains in the condition prevalent in the *praematurus* stage.

*Praematurus*.—Dilute brown, suffused more or less with violaceous, this being evident more especially on the anterior and posterior seg-



ments both above and below. Head light ferruginous. Posterior legs as usual more pigmented than the others.

Antennae composed of twenty-six or twenty-seven articles of nearly adult proportions.

Ocelli six, in two series:—thus, 1+3, 2. The single ocellus and the first of the upper row of the same size or nearly so and much larger than the others, the most anterior smallest.

Prosternum as in the adult.

Coxal pores small and pale; 2, 3, 3, 2.

Spines of the first legs,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 0, 1}$ ; of the second pair,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$  or  $\frac{0, 0, 0, 2, 1}{0, 0, 0, 1, 1}$ ; of the third to sixth,  $\frac{0, 0, 0, 2, 1}{0, 0, 0, 1, 1}$ ; of the seventh,  $\frac{0, 0, 1, 2, 1}{0, 0, 0, 2, 1}$ ; of the eighth and ninth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 1, 1}$ ; of the tenth and eleventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 1, 2, 1}$ ; of the thirteenth,  $\frac{0, 0, 2, 1, 1}{0, 0, 2, 3, 1}$ ; of the penult,  $\frac{0, 0, 2, 1, 1}{0, 1, 3, 3, 1}$ ; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ .

Claw of the female gonopods small and pale, the three lobes distinct but appearing more slender and acute than in the adult. Proximal article with about six bristles on its ventral surface. Spines 2+2; the inner one of each pair shorter and much more slender than the outer and acutely acuminate from the very base; in the outer spine also the demarcation between basal and acuminate portions less distinct than in the adult.

(Canton, Miss.).

*Genitalis I*.—Very dilute yellowish, with the head as usual more densely pigmented. Antennae and legs pale; the last pairs of legs with more pigment, very pale yellowish.

Antennae composed of from twenty to twenty-three articles. Submoniliform. The last article conspicuously long. Hairs straight; of moderate length; not dense.

Ocelli four in one or two series:—thus, 1+3, or 1+2, 1. Small and pale.

Teeth of prosternum pale, their form and relations, as those of the ectal spines, as in the adult or nearly so.

Coxal pores small and weak edged; 1, 1, 1, 1 or 1, 2, 2, 1, the more proximal one when two are present on a coxa being considerably smallest.

Anal glands still evident but not very distinct.

Spines of first and second pairs of legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 1}$ ; of the third to ninth,  $\frac{0, 0, 0, 1, 1}{0, 0, 0, 1, 1}$ ; of the tenth to thirteenth,  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 1, 1}$ ; of the penult,  $\frac{0, 0, 0, 0, 0}{0, 0, 1, 1, 1}$ ; of the anal,  $\frac{0, 0, 0, 0, 0}{0, 0, 1, 1, 0}$ .

(Sterling, Ill., July).

TYPE LOCALITY.—Utah (Provo!).

LOCALITIES.—Utah (Provo! Salt Lake City!); Colorado (Colorado Springs! Ft. Collins!); Illinois (Sterling! Dwight! Peoria!); Kentucky (Lexington!); Tennessee (Johnson City!); Virginia (variety, Lynchburg! Balcony Falls!); New Jersey (Haddonfield!); Pennsylvania (Philadelphia! Ardmore!); Wisconsin (Janesville!); Massachusetts (Hough's Neck!); Alabama (Birmingham!); Mississippi (Brookhaven! Canton!).

*TIDABIUS OPIPHILUS*, sp. nov.

DIAGNOSIS.—Ventral spines of anal legs 0, 1, 3, 1, 0. Dorsal spines of penult legs 0, 0, 3, 1, 0. Third joint of tenth to fourteenth pairs of legs with three dorsal spines. Ventral spines of eleventh legs, 0, 0, 1, 3, 1. Ventral spines of first legs, 0, 0, 0, 1, 1.

Articles of antennae 27 to 32.

Ocelli 9 to 12 in three or, rarely, in four longitudinal series.

Head subcordate; wider than long.

Distance between chitinous spots 3.7 times as great as the dental line; 2.3 times the width at median incision.

Body 9 to 9.5 times longer than the width of the tenth plate.

Claw of the female gonopods much as usual. Basal spines broad proximally with sides subparallel; acuminate portion about two thirds the total length. (Plate 5, fig. 9).

Brown; first and last plates darker. Head dark brown of a dilute ferruginous tinge.

DESCRIPTION.—Dorsum brown; first and caudal plates darker; the median region pale. Head darker, brown of a dilute ferruginous tinge, lightest in front of suture. Antennae brown proximally, lighter, yellowish or pale ferruginous, distally. Prosternum brown, the prehensorial feet paler. Venter very pale, tinged with violaceous anteriorly and the caudal plates darker, burnt brown. Legs pale like the venter; the caudal pairs darker, brown, commonly brighter distally.

Slender, moderately attenuated cephalad; 9 to 9.5 times longer than width of the tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 48:44:45:51:52:49.

Head subcordate, being considerably narrowed cephalad; wider than long in about ratio 49:47. Hairs of moderate length, sparse.

Antennae short. Composed of from 27 to 32 articles which are short and very short. Hairs rather short, subdense.

Eyes each composed of from 9 to 12 ocelli in three or four series:—*e. g.*, 1+4, 3, 2; 1+4, 3, 3; 1+4, 3, 3, 1.

Prosternum 1.56 times wider than long. Distance between chitinous spots 2.31 times width at level of bottom of median incision; 3.7 times the dental line. Median incision v-shaped; sides subparallel distad, concave and converging caudad. Teeth small and acute, the interval between the two of each pair well rounded at bottom, not at all angular. Spine a little ectad of tooth, straight and slender; extending directly cephalad. Anterior lateral margins convex distad then becoming concave and bending out almost directly ectad caudally.

First dorsal plate widest a little back of anterior end where the sides are rounded, becoming there nearly straight and gently converging to the rounded caudal corners; 1.9 times wider than long. Posterior angles of eleventh and thirteenth plates very weakly produced caudad; those of the ninth straight to more or less obliquely excised.

Coxal pores 3, 4, 4, 3-3, 3, 3, 3; often decreasing markedly in size proximal on each coxa, the most proximal then being minute.

Spines of first legs,  $\frac{0, 0, 1, 1, 1}{0, 0, 0, 1, 1}$ ; of the second to fifth,  $\frac{0, 0, 2, 2, 1}{0, 0, 0, 2, 1}$ , of the sixth,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$ ; of the seventh,  $\frac{0, 0, 2, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 3, 2, 2}{0, 0, 0, 2, 1}$ , of the eighth,  $\frac{0, 0, 3, 2, 2}{0, 0, 0, 2, 1}$ ; of the ninth,  $\frac{0, 0, 3, 2, 2}{0, 0, 0, 2, 1}$  or  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 2, 1}$  (noted on one side only, the other leg having the first formula); of the tenth,  $\frac{0, 0, 2, 2, 2}{0, 0, 1, 2, 1}$ ; of the eleventh,  $\frac{0, 0, 3, 2, 2}{0, 0, 1, 3, 1}$ ; of the twelfth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$ ; of the thirteenth,  $\frac{0, 0, 3, 1, 1}{0, 0, 2, 3, 1}$  or  $\frac{0, 0, 3, 1, 1}{0, 1, 2, 3, 1}$ ; of the penult,  $\frac{0, 0, 3, 1, 0}{0, 1, 3, 3, 1}$ , claws 2; of the anal,  $\frac{0, 0, 2, 0, 0}{0, 1, 3, 1, 0}$ , claws 2. None of the coxae armed.

Anal legs short; uniformly but only a little thickened; longitudinally sulcate above, especially the fifth article. Penult legs similar, but a little more slender.

Claw of female gonopods very short; bent; median lobe longest and the lateral subequal as usual. Sides rather broad with sides of proximal division subparallel; acuminate portion rather long, being mostly about two thirds of the total length, the apex acute or narrowly acutely rounded. (Plate 5, fig. 9). Mesal side of first article more or less convex, diverging from its fellow proximately.

Length from 8 to 10 mm. A female 9 mm. long has tenth plate 1 mm. wide; antenna 2.8-3 mm. long; anal leg 3 mm. long.

LOCALITY.—Wisconsin (Beloit!).

## TIDABIUS BONVILLENSIS (Chamberlin).

*Lithobius bonvillensis* Chamberlin, Ann. Ent. soc. America, 1909, 2, p. 189.

DESCRIPTION.—The original description of the types is as follows:—

Dorsum from light to blackish brown, the posterior border of most of the major plates usually lighter; head paler, brown or light brown, sometimes with a darker median area caudad of the frontal suture; antennae brown to blackish, yellowish or rufous distally; praesternum and feet concolorous with head; venter light brown to yellowish, the first and the last plates darkest; legs yellowish, the last few pairs commonly darker.

Head a little wider than long (3:2.9).

Antennae short; the first two articles long, others short, closely crowded; articles 29 in number.

Eyes each composed of 8-9 ocelli arranged in two series (1+4, 3; 1+5, 3); ocelli of moderate size.

Prosternal teeth small, slightly darkened.

Angles of none of the dorsal plates produced.

Coxal pores small, round, the distal ones of each series largest as usual; 3, 4, 4, 4.

Ventral spines of anal legs 0, 1, 3, 2, 0, claws 3. Ventral spines of penult legs, 0, 1, 3, 3, 1, claws 3. Ventral spines of first legs 0, 0, 0, 0, 1. None of the coxae at all armed.

Gonopods of female with the claw tripartite as usual, the lobes short and rather blunt. Basal spines 3+3; decreasing in size from the most ectal to the most mesal on each side; each spine acuminate distad of middle as usual.

LOCALITY.—Utah (Lake Point!).

This species was found in May under stones along the foot-hills.

## SIGIBIUS, gen. nov.

Dorsal spines of anal legs 0, 0, 1, 0, 0; ventral, 0, 1, 1, 1, 0; claws 2. Dorsal spines of penult legs, 0, 0, 1, 0, 0; ventral, 0, 1, 1, 1, 0, claws 2. Dorsal spines of thirteenth legs, 0, 0, 1, 0, 0; ventral, 0, 0, 1, 1, 1. Dorsal spines of twelfth legs, 0, 0, 0, 0, 0; ventral, 0, 0, 0, 1, 1. Dorsal spines of eleventh legs, 0, 0, 0, 0, 1; ventral, 0, 0, 0, 1, 1. Dorsal spines of first legs, 0, 0, 0, 0, 1; ventral, 0, 0, 0, 0, 1. None of the coxae at all armed.

Antennae short; articles (in type) 25.

Eyes composed of few ocelli (6 or less in type) which are arranged in either one or two series; single ocellus decidedly largest as in *Tidabius*.

Prosternal teeth 2+2; line of apices rather strongly recurved.

Coxal pores circular; uniseriate.

Posterior legs of male short; uniformly a little thickened; without any special lobes or processes.

Claw of female gonopods in type nearly bipartite, the ectal lobe commonly obsolescent, then contracting with all known species of *Tidabius*. Basal spines moderately slender, acutely and evenly acuminate from very base to apex.

Posterior angles of none of the dorsal plates at all produced.

Small in size (max. length of type species cir. 7.5 mm.).

TYPE.—*S. puritanus*, sp. nov.

DISTRIBUTION.—New England States.

Evidently this genus is closest to the preceding one, *Tidabius*. From this genus, however, it is clearly distinct in the spining of the legs; *e. g.* the dorsal spines of the anal legs being 0, 0, 1, 0, 0 whereas in all species of *Tidabius* the corresponding formula is 0, 0, 2, 0, 0; also the ventral spines of these legs are 0, 1, 1, 1, 0, whereas in the other genus the formula is 0, 1, 3, 1, 0 or, more rarely, 0, 1, 3, 2, 0; and the contrast in spining of the penult legs is still greater and equally constant. The prosternum is similar to that of *Tidabius* though the line of apices of teeth is more strongly recurved than in any species of the latter genus. The basal spines of the female gonopods are conspicuously different in shape, being more slender and not showing any division into broader proximal portion, the sides of which are divergent or parallel, and an acuminate distal portion, so characteristic in all species of *Tidabius*, but attenuated uniformly from base to apex; etc. The ocelli are fewer in number and show a pronounced tendency to form but a single series. *Tidabius* and *Sigibius* may be at once separated from the other two genera dealt with in the present paper by the larger number of antennal articles and by their not having the posterior legs of males characterized by any special processes or lobes.

#### SIGIBIUS PURITANUS, sp. nov.

DIAGNOSIS.—Dorsal spines of third to eleventh pairs of legs, 0, 0, 0, 0, 1; ventral 0, 0, 0, 1, 1. Dorsal spines of first and second pairs, 0, 0, 0, 0, 1; ventral, 0, 0, 0, 0, 1.

Ocelli 3 to 6 in one or two series.

Prosternum near 1.57 times wider than long, Distance between chitinous spots  $2\frac{1}{3}$  times the width at median incision; 3.86 times the dental line.

Coxal pores 2, 3, 3, 3-3, 4, 4, 3.

Claw of female gonopods wide bipartite or with obsolescent third tooth; the two main lobes short and rounded.

Body on average about 7.78 times longer than width of tenth plate.

Head a little longer than wide (42: 40 to 41: 40).

First dorsal plate about 1.7 times wider than long.

Brown to testaceous, often of dilute olivaceous caste; caudal dorsal plates and commonly 1st one darker, reddish brown. Head chestnut, light ferruginous in front of suture.

DESCRIPTION.—The dorsum is brown to testaceous, often of dilute olivaceous caste; caudal plates, and usually also the first one darker, reddish brown or chestnut, and one or more of the plates immediately caudad of the first one often with their posterior borders also of the darker color or the first plate also similarly darker only along its caudal border. Head chestnut in appearance, of a lighter ferruginous color in front of suture, behind which there is present a median black spot extending toward the caudal margin. Antennae mostly dark brown proximally, becoming lighter distad, the distal portion being mostly yellowish or sometimes of a rufous tinge. Prosternum dusky brown, the prehensorial feet lighter, rufous distally. Venter pale; the caudal plates darker, ferruginous to burnt brown; the anterior segments or entire venter suffused with purplish. Legs mostly pale, but the caudal pairs bright yellow or light orange excepting proximally, where they are brown.

Body strongly attenuated cephalad, about 7.8 times longer than width of tenth plate. Widths of head and of first, third, eighth, tenth, and twelfth plates to each other as 39: 38: 42: 50: 50.5: 50 in a female type; in male as 39: 37.5: 39: 46: 47: 46, the female being thus proportionately the broader caudad. Head subcordate, mostly a little longer than wide (42: 40 to 41: 40).

Antennae very short; articles mostly 25, very short; hairs moderately long, not very dense.

Eyes each consisting of from 3 to 6 ocelli arranged in one or two series:—*c. g.*, 1+2; 1+2, 1; 1+3, 2. Single ocellus largest.

Prosternum about 1.57 times wider than long. Distance between chitinous spots  $2\frac{1}{3}$  times width at level of bottom of median incision; 3.86 times length of dental line. Median incision moderately wide,



sides straight and strongly converging. Teeth small and acute; the line of apices strongly recurving, the ectal tooth on each side being borne considerably farther forward than the mesal one. Spine inserted at base of outer tooth, scarcely stouter at base than the hairs, becoming slender and finely pointed distad.

First dorsal plate 1.7 times wider than long. Minor plates all with caudal corners obliquely somewhat excised; none with them at all produced.

Coxal pores 2, 3, 3, 3-3, 4, 4, 3; increasing in size distad on each coxa.

Spines of first and second pairs of legs,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 0, 1}$ ; of third to eleventh,  $\frac{0, 0, 0, 0, 1}{0, 0, 0, 1, 1}$ ; of twelfth,  $\frac{0, 0, 0, 0, 0}{0, 0, 0, 1, 1}$ ; of thirteenth,  $\frac{0, 0, 1, 0, 0}{0, 0, 1, 1, 1}$ ; of the penult,  $\frac{0, 0, 1, 0, 0}{0, 1, 1, 1, 0}$ ; claws 2; of the anal also,  $\frac{0, 0, 1, 0, 0}{0, 1, 1, 1, 0}$ , claws 2.

Posterior legs in male, short, very moderately and uniformly enlarged.

Claw of female gonopods broad; the ectal lobe commonly almost or wholly obliterated, the other two lobes distinct, with the median usually considerably the larger, or sometimes the two lobes are nearly equal and bluntly rounded. Basal spines differing from those of species of *Tidabius* in being more slender and in being attenuated evenly from the very base to the acutely rounded apex, their being no distal acuminate portion sharply delimited from a basal. Inner edge of first article straight.

TYPE LOCALITY.—Massachusetts (Cambridge!).

LOCALITIES.—Massachusetts (Cambridge! Arlington Heights! Forest Hills! Waverley! Mattapan! Blue Hills! Wellesley! Hough's Neck!); Maine (Orono! Bangor! Hampden! Old Town!).